

KEYFRAME

MAGAZINE

The Ultimate Guide to 3D Animation & Special Effects

September / October 2004



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RAVEN TALES

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PHOTOREALISM
IN MINUTES

THE KEY TO ACHIEVING
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ALL GOOD THINGS...

They say that the ending of one thing is really just the beginning of something else. I believe this.

Today, as I head out the door for the 2004 SIGGRAPH, I'm writing up the last editorial for Keyframe magazine. I've been editor of this magazine for a little over a year now, and it's been quite a fun ride. The magazine has improved, and we've been able to provide readers with great coverage of LightWave 3D and related tools.

But now, it's on to something new. Many people have been worried that the LightWave magazine they've come to know

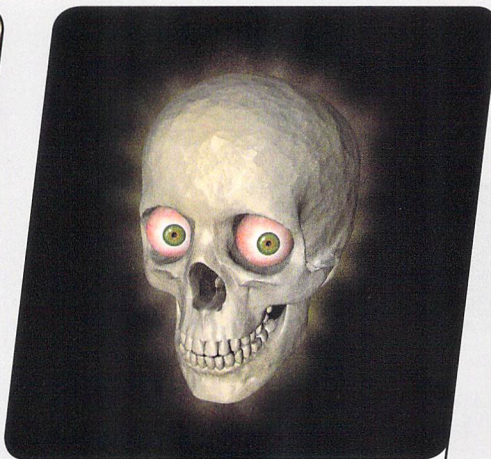
and love will be lost, which is not the case. Our new magazine, HDRI 3D, will continue to cover LightWave, just as Keyframe has. But then it will take the reader into other applications useful for any animator. It's always good to read about other applications and find out what they can do, or for that matter, what they can't do. The new magazine will be larger than Keyframe and DMG Publishing is doing its best to make sure it covers what you, the reader, wants.

Thank you for your support of Keyframe magazine over the years. We look forward to seeing you with HDRI 3D!

Lawrence Ables



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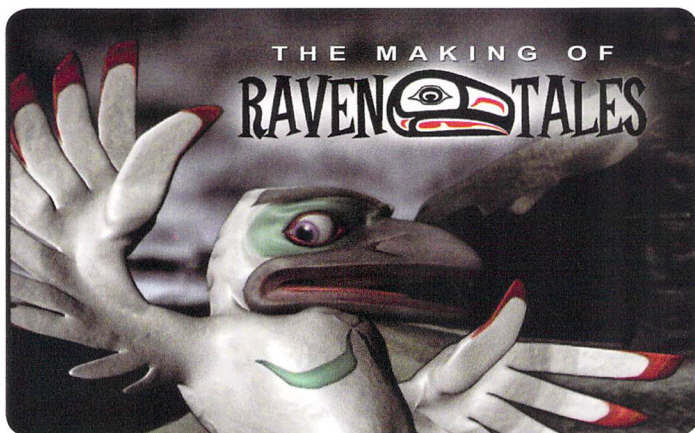
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As **KEYFRAME MAGAZINE** presents its last cover before becoming **HDRI 3D**, we thought we would pay tribute to some of our readers' favorite covers. Some of the best 3D art out there has graced our covers. Thank you to all of the artists who contributed their talents to our magazine. We will all miss Keyframe Magazine, but we look forward to bringing the readers even more great content, more tutorials, more of what you picked up Keyframe for, in our all new HDRI 3D magazine. Stay with us...you're going to like what you see.



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latest printing technologies. With a worldwide distribution of its magazines, DMG prides itself on high standards of customer service and subscriber support.

LW ESSENTIALS

BACKGROUND RADIOSITY

A quick and easy way to create a great way to show off your models is by using Background Radiosity. Background Radiosity will uniformly illuminate the object when all scene lights are disabled and the background color is set to white.

SET UP SCENE

1. Open the Background Dialog box (ctrl-F5) and *change the Background Color to white*. SEE FIGURE 1.

2. Select the *Light(s)* in your scene, open Item Properties / Basic, and *enable "Affect OpenGL"* only (disable Affect Diffuse and Affect Specularity). This disables the lights for rendering, but allows you to see your object, as you work. SEE FIGURE 2.

3. Click on *Global illumination* (in Lights / Item Properties) and select "Shading Noise reduction" and "Enable Radiosity." Set the Type to "Backdrop Only." Select a choice of "Rays per Evaluation" from the dropdown list. The more Rays Per Evaluation, the longer the render will take. SEE FIGURE 3. Experiment with values to get a good result with minimal time. The images I rendered took about 30 minutes at a resolution of 1280 x 1024 with the "Rays Per Evaluation" set at 10 x 30.

4. Camera / Item Properties—set *Antialiasing to Low Enhanced or Medium Enhanced*.

LOAD OBJECT

5. Load an object. I loaded the ArmIK object included with LightWave 7.5. To get nice shadows, add a flat ground object for it to rest on. SEE FIGURE 4.

6. Render a Frame. SEE FIGURE 5.

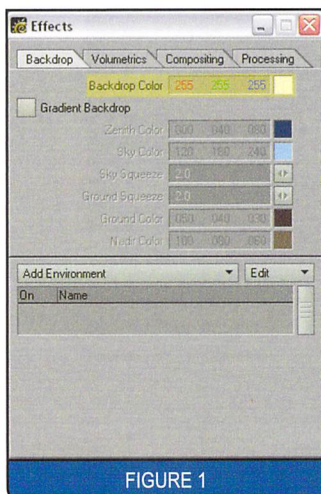


FIGURE 1

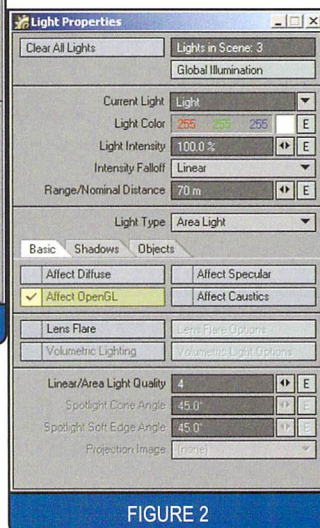


FIGURE 2

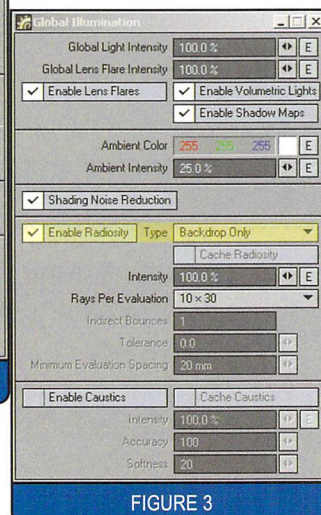


FIGURE 3

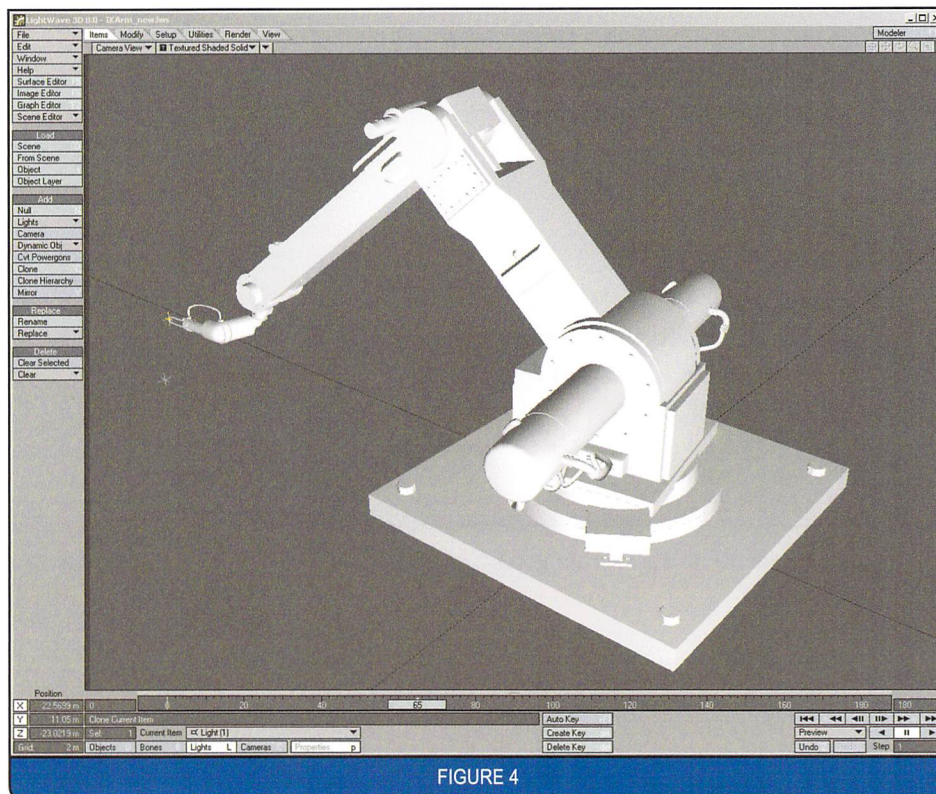


FIGURE 4

SET UP OUTLINES

7. *Select the Object*, and click on Object Properties. Select the Edges tab, and enable *Silhouette*, *Unshared*, *Sharp Creases*, and *Surface Border Edges*. SEE FIGURE 6.

8. Render a frame. SEE FIGURE 7.

In order to spice up your render, you can always adjust the parameters of the various settings or add lights and adjust the Radiosity Intensity setting of the Global Illumination.

If you have a lot of models to render, it is efficient to create and save a Blank Scene with everything set up, so all you have to do is just plop in each object and render it.

A good way to add details to your object, like the rectangle drawn on the last section of the arm, is by forcing edges to be drawn. Use Modeler to assign different Surface names to the desired polygons, and enable "Surface Borders" Edges.

I usually post-process the image in Photoshop. Typically, the images look a little better with the Brightness increased to about +3 and Contrast increased to about +8. I also use the Photoshop Noise Filter to add some "film grain" to the image. About 1-3% is enough to make the image look less computer-generated. ■

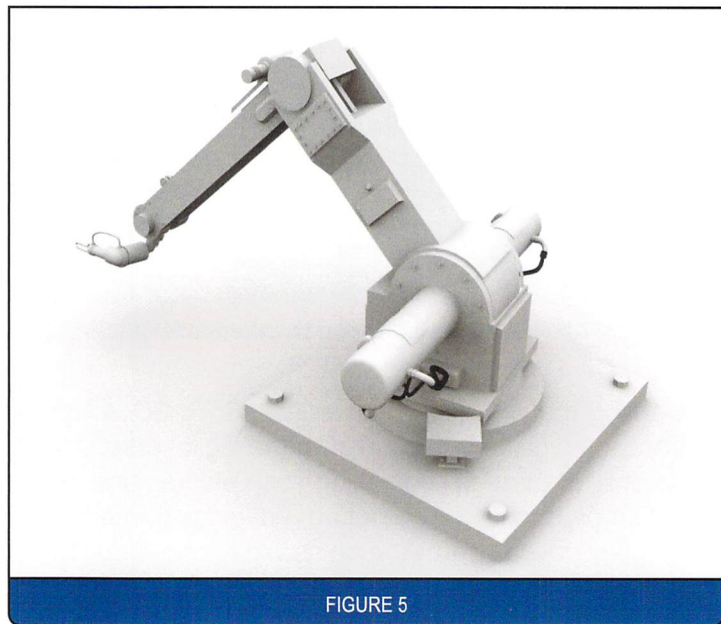


FIGURE 5

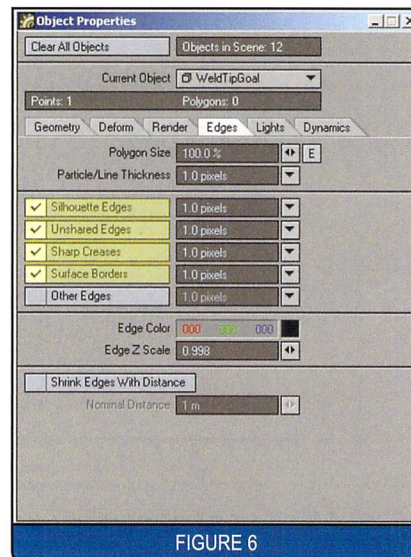
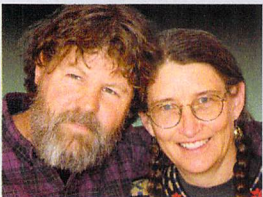


FIGURE 6



BRAD CARVEY
HAS BEEN DOING
COMPUTER
ANIMATIONS FOR
A LONG TIME. IN
1969, BRAD USED
AN ANALOG
COMPUTER,

WHICH WAS THE SIZE OF A CAR, TO PRODUCE HIS FIRST COMPUTER ANIMATION. BRAD IS AN ELECTRICAL ENGINEER AND AN EMMY AWARD-WINNING MEMBER OF THE VIDEO TOASTER DEVELOPMENT TEAM. HE PREFERS TO DO FEATURE FILM WORK. HIS CREDITS INCLUDE FILMS LIKE *MEN IN BLACK*, *STUART LITTLE*, *BLACK HAWK DOWN*, *KATE & LEOPOLD* AND *MASTER OF DISGUISE*.

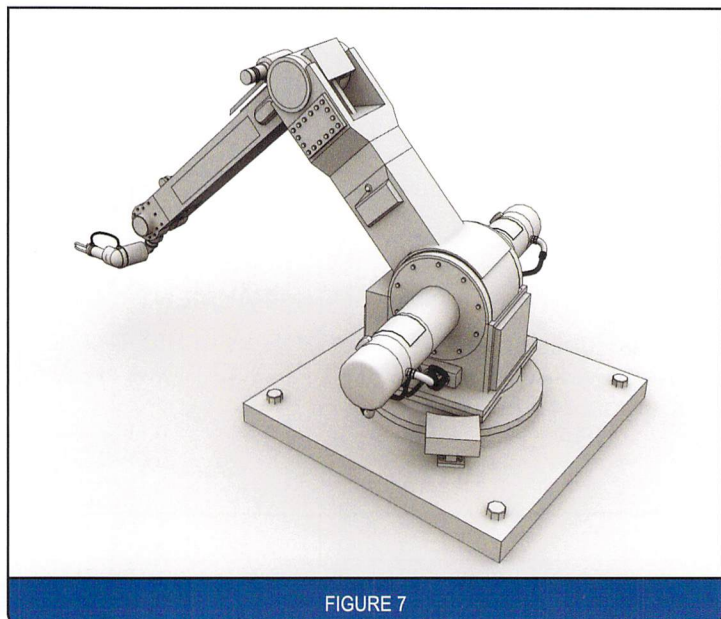


FIGURE 7

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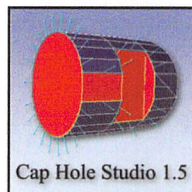
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THE MAKING OF RAVEN TALES



From the start with *Raven Tales*, we knew we wanted to use Maya to do all of our character animation. It was a tool we were all familiar with, and its character controls were mature, robust and intuitive. We also knew that since we were dealing with a prehistoric world, one that was in the midst of a massive primordial upheaval, we had a heavy demand for particle effects; after all, nearly every shot featured boiling clouds, rain, splashes, smoke and lava.

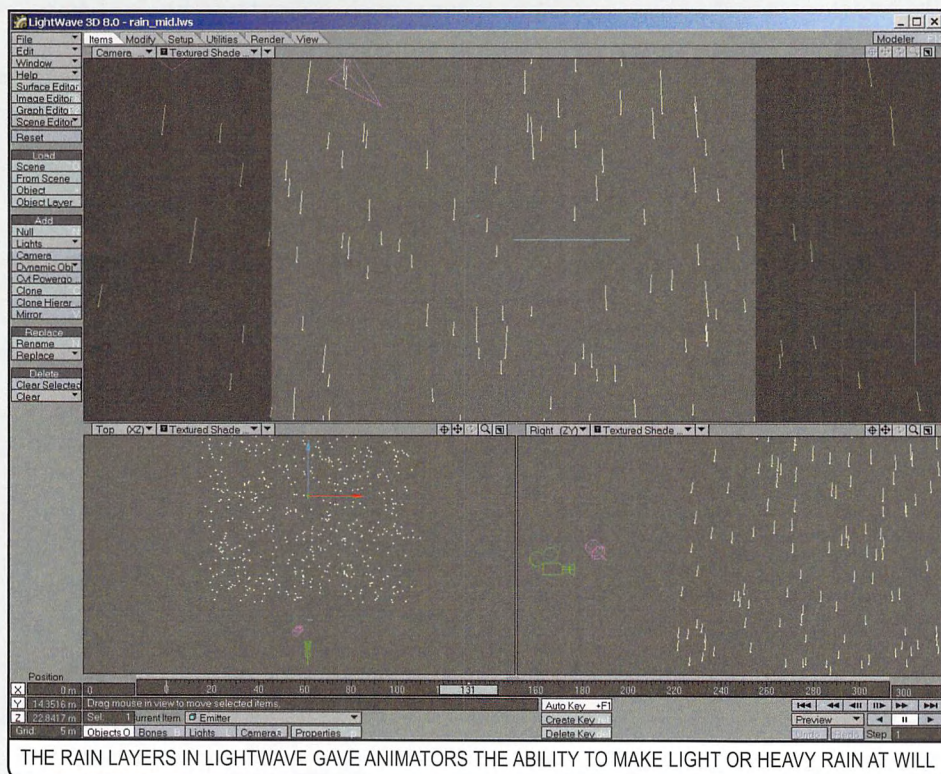
Maya could do all these, but the tools were not as intuitive and we found the render times were prohibitive. We were under a strict deadline, and to get the effects we wanted, we realized we'd have to turn to another system to develop the particle effects we were looking for and composite them along with the character and set layers. Being familiar with LightWave and Digital Fusion, and knowing that in both cases they were tools that were easy to use and would provide great results, we realized we had the perfect tool set to compliment the character and set renders we'd already completed.



THE BEAUTY PASS VERSION OF THE BACKGROUND WITH OUR CHARACTER, FROG, IN SET

First we broke down each act into separate scenes. Working from a single scene and camera setup, we first opened up a beauty pass version of the background set with the character in set.

Since we realized that the only particle effects that would be placed foreground to the characters would be foreground rain or a smoke haze, it was easy to work from the beauty pass without thinking about the character layer at all.



THE RAIN LAYERS IN LIGHTWAVE GAVE ANIMATORS THE ABILITY TO MAKE LIGHT OR HEAVY RAIN AT WILL

From here we defined the particle layers in each scene as they would be needed. In this scene, we defined them as foreground and background rain, splashes, clouds, smoke and lava. Many of these effects would be used repeatedly throughout the production, so they were built to meet several needs simultaneously. A background smoke element could be re-used in the same frame as a foreground haze by using a frame offset and a blur filter. That same rendered smoke element could also be used with a displacement effect to create the illusion of light refracting through hot gas. These effects are typically unrealistic to implement at rendertime, but applying them as an image post effect can save a lot of time.

Once we'd defined the particular particle needs for a scene, we figured out the total running time for each element, then turned to LightWave to start creating the particle assets.

In LightWave, we first created the rain passes using simple motion blurred hypervoxel emitters. Several rain passes

were created so that they could be layered in Digital Fusion. By layering the rain with different frame offsets, they would create the illusion of completely random rain patterns from a base set of five or six layers. This also made it possible to create heavy or light rain by adding more of these layers to the scene.

We defined the rain strictly as a foreground and background plane to eliminate the chance that it may appear that the rain was passing through the characters. Although Z-buffer data existed for the scenes, it was more realistic to use object mattes to define foreground and background. Splashes were rendered as a small grouping of splash forms that we could place virtually anywhere within the frame. A splash element was created in LightWave to splash and disappear so that none of the drops suddenly disappeared when the drop was positioned in the background; this allowed us to place as many or as few splashes on a character as was needed and time them to events in the scene, such as the moment the camera passes close to an object.

INTERVIEW & INSIGHT: CONVERSATION WITH CHRIS KIENTZ

So, tell our readers a little about this first episode of Raven Tales?

Sure. *Raven Tales* is based on a series of myths from the Northwest Coast Native community going back some 5,000 years. The myths almost always have Raven in them, who is pretty much the original Bugs Bunny. Like most myth cycles, the first stories are about the beginning of the world, so that's where the first episode starts out. Basically it all takes place on a primordial earth, before life had even begun. Which was cool since we got the chance to do all sorts of lava and steam, smoke and storm effects. Quite a challenge render-wise, but worth it.

How many episodes are planned, and can you tell us anything about them?

We've got a thirteen episode story arc outlined already, and the first six episodes are in a completed script form. And I should say now they are all comedies. That's one thing about Northwest Coastal myths; they have a great sense of humor. Anyway, along with Raven helping in the creation of the world, we have Raven "finding" the first people in a giant clam shell, and the second episode, which is in pre-production now; an episode about a giant bird called the Kulos and a lot of trickery on the part of Raven.

*In an industry where "sci-fi" and "futuristic" are usually king, you've chosen to go to the complete other end of the spectrum with *Beginning of Time* folklore - what inspired you to go with this story?*

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INTERVIEW & INSIGHT: CONTINUED...

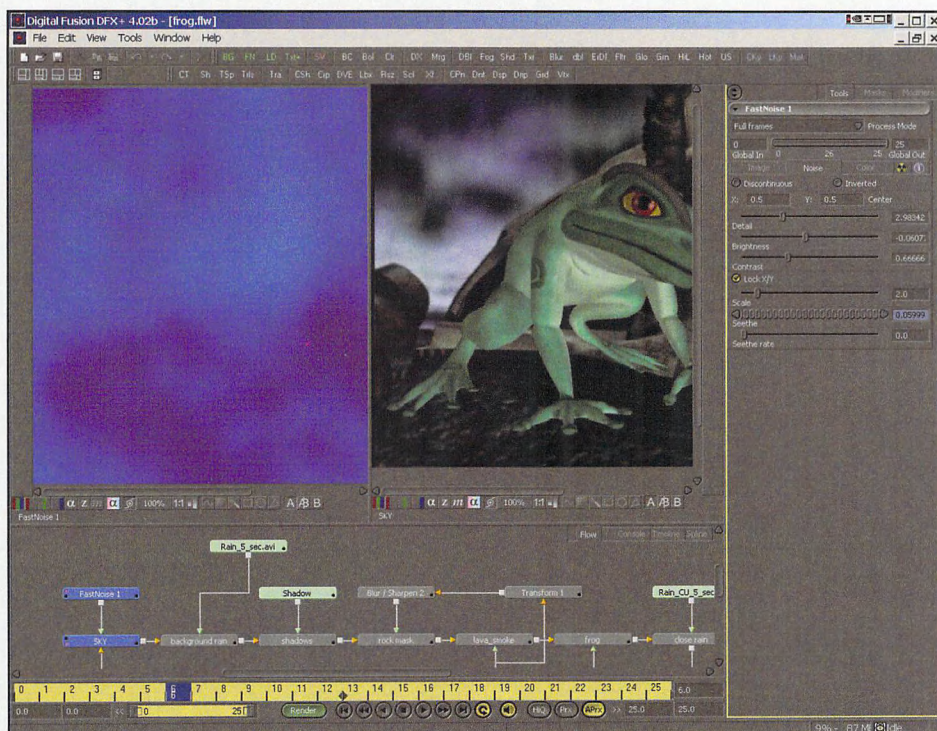
Really, for us it was two things. First off, these myths are amazing. Truly wonderful stories and they are quickly being forgotten by everyone but a very small, elite audience of art collectors and anthropologists. And that's just a shame. These are some very funny, wonderful stories and we wanted to make sure they were in a medium everyone could appreciate. The second thing is, with the medium of computer generated imagery, you are only limited by your imagination. We were all a bit tired of giant robots and spaceships, because after a point it's all just variations on a theme, so it was great to be given the chance to do something completely different, something that could challenge our imaginations again.

Along the same lines, you chose 3D animation as the way to tell your story, as opposed to more traditional types of animation. What was involved in that decision?

It's funny, the decision to go to 3D actually hurt us with some funding agencies who just couldn't see Native Art and 3D animation working together. They actually told us they thought the "primitive" aspect of the art would be lost. Which, when you think about it, is a bit of insult since there is nothing primitive about Northwest Coast art. It is very polished, abstract art of the highest quality. Anyway, they wanted us to use more traditional methods. There was actually a bit of a debate about it, but we were committed the moment we saw our first test renders and realized that 3D would make the characters and the locations come to life so much more than traditional animation.

What was the most challenging aspect of making the film?

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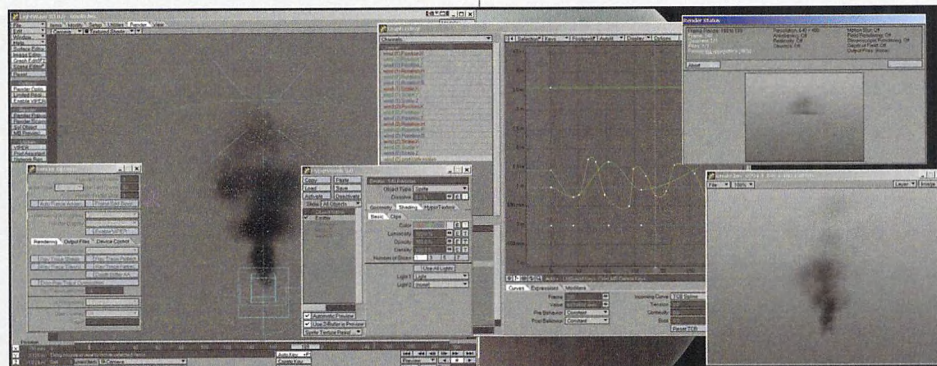


THE CLOUD ELEMENTS WERE ADDED AND COLOR ADJUSTED USING MULTICOLORED FRACTAL NOISE PATTERNS

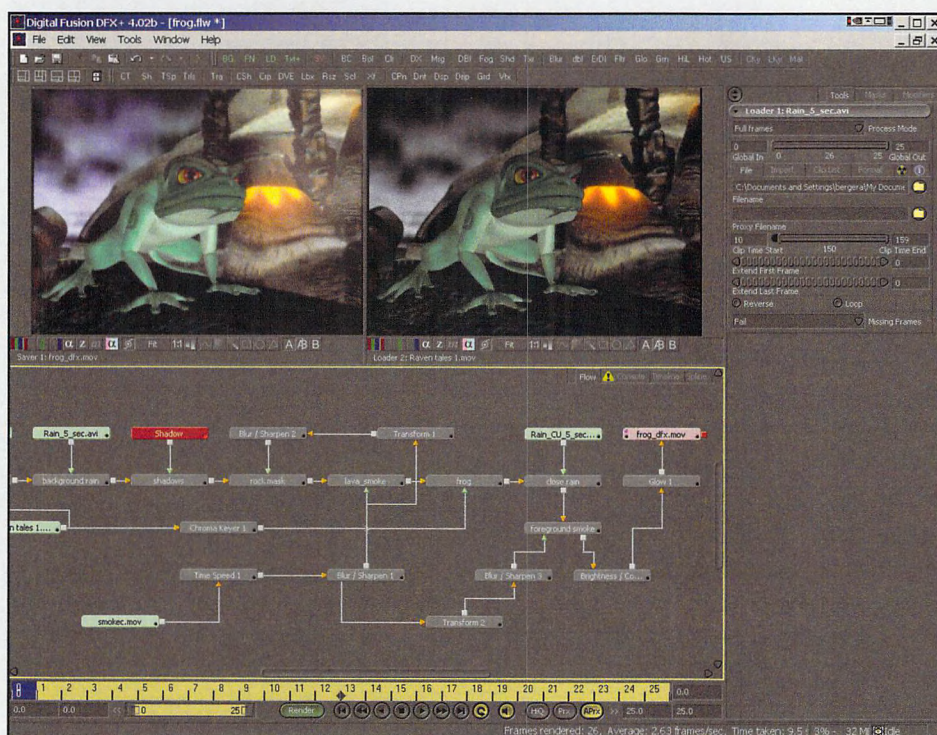
Next, we ran a series of cloud sets, all from a single particle cloud, but rendering each one from a different camera angle with slightly different illumination. The clouds were originally done in Maya as paint effects, then developed into a series of interlocking sky domes. This gave us some great dynamic effects without too much render time.

Further tweaks to cloud elements could be made in post by changing the clouds color or brightness. Color was added to cloud scenes using an animated multi-colored fractal noise pattern that was overlayed on top of rendered cloud elements.

The smoke was a simple particle column, rendered once and placed in the frame according to need. The color and consistency of the smoke was developed by first creating the chaotic particle motion using wind elements to get a nice smoky motion. LightWave hypervoxels were used to create the general visual look of the smoke. Hypervoxels normally have a significant render time, but we could afford to make a beauty smoke pass because we could use the same animation several times throughout the production. The smoky element was rendered off as a high resolution video clip that could be resized to fit in as a foreground or background element.



SMOKY ELEMENTS ARE PARTICLE PLUMES WITH LIGHTWAVE HYPERVOXELS CREATING THE GENERAL LOOK



FINAL FROG - THE CHARACTER LAYER WAS BROUGHT BACK INTO THE FRAME AND COMPOSITED

Once the smoke was positioned in DFX, it could be modified in several ways. Firstly, the transparency and blending mode could quickly alter the smoke's look when composited. Also, the alpha channel could be used to keep the smoke shape, while fractal noise colored the smoke or even made it more transparent.

The final particle asset, the lava, was developed as a series of glow particle passes in LightWave. The shape could be quickly tweaked to fit the different areas where lava was required and integrated into the frame as a separate element.

Finally, using Digital Fusion, the character layer was brought back into the frame and we did our composite. The final version looked like this (SEE *FINAL FROG* ABOVE).

Overall, by using this method, we cut our render times by a third or more, giving us the opportunity to make a lot more tweaks and fixes on the character layers. ■



CHRIS KIENTZ IS THE EXECUTIVE PRODUCER, CO-DIRECTOR AND CO-WRITER OF *RAVEN TALES*.

CHRIS TRACES HIS NATIVE ANCESTRY BACK TO THE EASTERN CHEROKEE NATION OF TENNESSEE AND DAWES ROLLS. FOR THE PAST TEN YEARS CHRIS HAS WORKED AS AN INDEPENDENT PRODUCER AND ANIMATOR DEVELOPING MULTIMEDIA PROJECTS FOR COMMERCIAL CLIENTS IN BOTH CANADA AND THE UNITED STATES. HE HAS SCRIPTED, PRODUCED AND DIRECTED AWARD-WINNING VIDEO, ANIMATION, INTERACTIVE MEDIA AND WEB SITES FOR NUMEROUS CLIENTS. HE HAS ALSO DEVELOPED ECOMMERCE INITIATIVES FOR CLIENTS INCLUDING RITCHIE BROS. AUCTIONEERS AND DIGITAL DISPATCH SYSTEMS.

GROWING UP AMONG THE NAVAJO, ZUNI AND HOPI PEOPLE OF NEW MEXICO GAVE CHRIS A GREAT RESPECT FOR NORTH AMERICAN ABORIGINAL ART AND CULTURE. *RAVEN TALES* REPRESENTS THE CULMINATION OF THIS INTEREST.

INTERVIEW & INSIGHT: CONTINUED...

Getting the funding. If we could do it again we wouldn't even consider any kind of government funding but go straight to the private investor. Honestly, the technical issues were all pretty easy to solve once we stepped back and considered our full tool set and realized we could integrate LightWave and Digital Fusion into the mix.

How did LightWave help you achieve the effects you were looking for?

Since the first episode takes place in such a primordial environment, we had a lot of render-heavy elements, like rain, splashes, puddles, smoke and lava. We were a bit stuck in Maya in terms of render times and we found the tools a bit hard to use. LightWave gave us the option of creating the same particle effects at a much faster pace, freeing up time for us to concentrate on the characters.

Okay, now, explain the All Roads Film Project.

The All Roads Film Project was developed by National Geographic to foster the creation of indigenous art in the film/video medium. They turned out to be one of our biggest advocates and really helped us get the funds we needed to polish the final product.

How will the film be distributed? Can people buy it on DVD when it comes out?

The film will be at a number of different film festivals as well as be broadcast Canada-wide in February and sometime later in the United States. It will be available on DVD from www.raventalles.ca, as well as Amazon and no doubt a lot of other places. All Roads is also talking about distribution.

Thanks for chatting with us!

Thank you.



CAMERA MAPPING

Photorealism in Minutes

Last time, I showed you how to prepare your heavily populated scenes for faster renders and put them all back together again for added effect in a compositor. We carry on now in a similar vein with camera mapping.

Camera mapping, or image projection mapping, as it is also known, is one of the hottest little tricks in the world of VFX. It is simple and fast, both to produce and render, and gives excellent results every time. Firstly, let me take you through the basic uses for and principles of camera mapping.

The main use for the technique is in visual effects, where CG characters, vehicles, etc, will be placed into live action backgrounds. Often a character needs to be placed into a scene with actors, or other moving elements, in which case careful camera tracking must be performed, a process requiring not only a great deal of skill in itself, but also some very expensive software. (Take a look at packages like Boujou on the net if you're wondering just how expensive.)

Camera mapping shines as an easy alternative where there is no movement of live action elements in a shot. It involves taking a single still image and projecting it from the camera's viewpoint onto geometry to recreate the scene. The camera's moves, pans, and zooms can then be performed within the 3D package itself, no tracking required. It does have limitations in so far as how much movement you can actually give the camera, but whilst it is most commonly demonstrated using small pans or tilts only, it is actually capable of far greater degrees of movement if the whole thing is set up correctly from the start. Additionally, it also allows us to have full control of the scene's motion blur and depth of field, things that are extremely difficult to match from live footage.

For this tutorial, I'm going to recreate in minutes the street I live on, and then shove in a dinosaur, just so the camera actually has something to be looking at. The dino used is the excellent T-Rex from the LW8 content disc, so don't credit its brilliance to me. I have included all the files you will need



NIKON E4500 DIGITAL CAMERA

for this, as well as a few extras. Both can be found at <http://www.keyframemag.com/resource>. The first, which contains all the source files, is `cammap.zip`, and the second, which contains final renders and the composite, is called `cammap_render.zip`. They're both quite large, so I recommend just downloading the first one for now.

The first things we need before we go anywhere near the computer are images to work with. I'll take you through the shoot.

I am using a digital camera for this. Here is mine, a Nikon E4500, with an FC-E8 fisheye converter lens. This camera knocks out a resolution of 4 MegaPixels,



THIS STREET WILL ACT AS OUR BACKPLATE

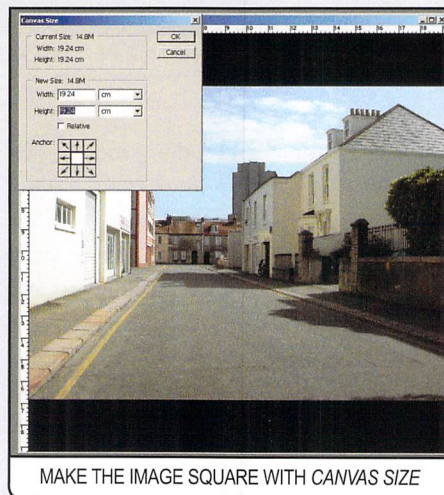
which is more than enough when doing this sort of thing at DV res, for example. Don't take the mention of this equipment as any kind of endorsement on my part, but the simple truth is that the camera and lens I am using here can be had for half the price of just a fisheye lens for an SLR camera, and just you try getting fisheye converters for the vast majority of digital cameras.

So being now in the street, or wherever, the first thing we want to shoot is our backplate. You should try and have a basic idea of the camera move you want to perform in mind before you get outside. For my own part, I am going to want to be able to swing the camera both ways, so I take my shot from roughly the middle of the road. I am also shooting from hip height, as I am looking at producing a handheld effect in LightWave, and the hip is, in effect, the vertical middle ground. I also make a note of the fact that my hip height is approximately 1.2m from the ground. We'll need this measurement later. I also keep a note of the exposure settings that the camera has used to get correct exposure of the scene. For me it was 1/500th sec at F7.2.

Having shot a backplate that we are happy with, we now want to move onto shooting a lightprobe image. Now you can go the whole hog here, and shoot lots



FISHEYE VIEW OF THE STREET SCENE



MAKE THE IMAGE SQUARE WITH CANVAS SIZE

of exposures to create an HDRI image, but for our purposes we won't bother, as HDRI is a whole other tutorial.

I set my camera over to manual mode, and set the shutter and aperture to the same settings as were used for the backplate, as this will ensure the lightprobe image has color and brightness that match the backplate perfectly. The simplest way to shoot these images is one straight up and one straight down, but the legs of the photographer make this impractical, so instead we'll shoot one forwards and one backwards. It requires a few more minutes in Photoshop to put them together, but does avoid having your legs, or other bits, in the pictures. I

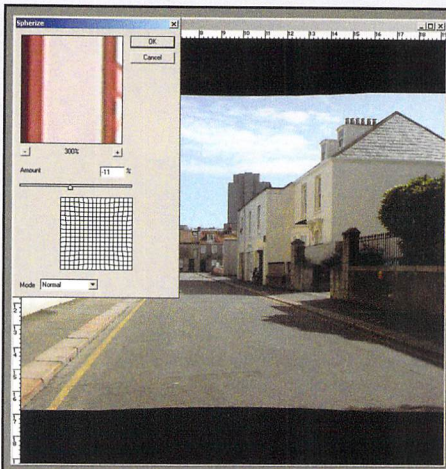
am also making sure that I move to take my lightprobe images to the approximate point in the scene where I am going to be inserting my CG character later.

Once we have our images, let's get them into Photoshop. You can find my three pictures in the zip you downloaded in the images folder: pic1, pic2 and pic3.

We'll deal with the backplate first. First of all, to make things work a little better, I have used the Clone Stamp tool to paint out unwanted elements. I like to get rid of passers by, as well as aerials, flagpoles, wires and so forth, as these things are just too small to map accurately. If you really desire these details in your finished piece, you can just add simple CG ones later, but I'll leave that up to you.

First things first; we want to get rid of the lens distortion. All camera lenses give this to some degree, especially wide angle ones. When we get into LightWave and start making cubes for the buildings, the curved edges of the picture won't line up with the straight ones of the geometry properly. Since we're lacking in a commonly available solution for the automatic removal of lens distortion, we are instead going to fudge it using Photoshop using the Spherize filter.

This filter works best on square images, so the first thing we want to do is make our image square, but without cutting it down or stretching it. Select *Image>Canvas size* from the menu, and making sure Relative is unchecked,

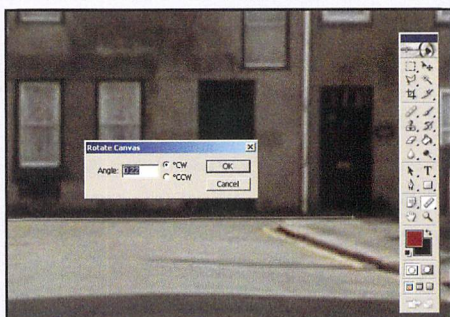


REMOVE DISTORTION WITH SPHERIZE

make the Height value the same as the Width value.

Now to remove the distortion. Select *Filter>Distort>Spherize*. Different amounts of distortion will require different values, and unfortunately you have to judge it by eye, but for this image I'm going for a value of -11%.

Now, even if you are a sticks and spirit-level puritan when it comes to the photography, there's still no guarantee that the level of the image you take will be 100% in line with Bank 0.0 in LW, so



ROTATE IMAGE TO ZERO THE HORIZON



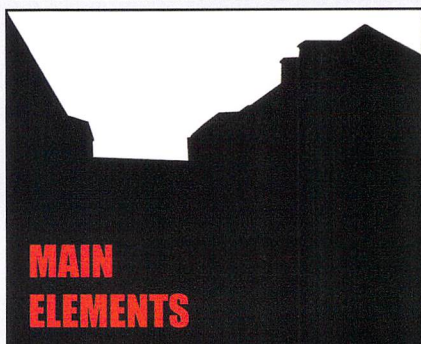
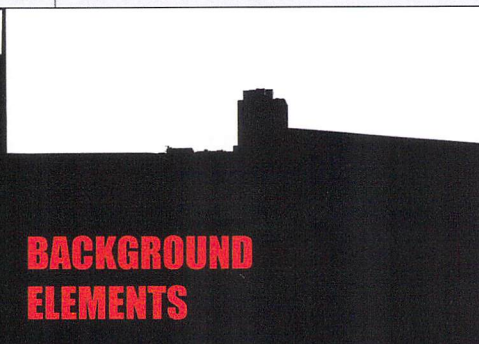
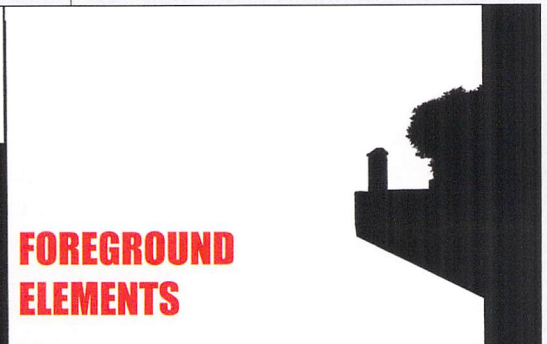
CROP YOUR IMAGE NICE AND TIGHT, KEEPING AS MUCH OF THE DETAIL AS POSSIBLE

we had better correct that, too. Right-click on the Eyedropper tool to reveal and choose the Measure tool. Drawing across the line of buildings at the back at street level, you'll get a line just off perfect flat. Now go to *Image>Rotate Canvas>Arbitrary*, and you'll notice that a value of 0.2 odd has been automatically entered. Hit OK to set the image on a perfect flat.

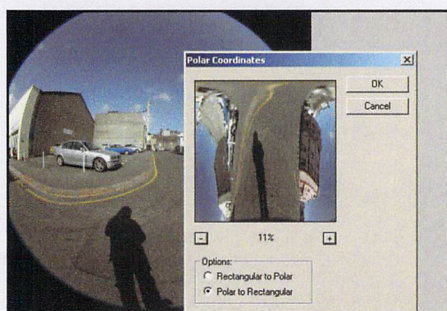
Once done, crop your image just nice and tight, keeping as much of the image detail as possible. You can find mine in the ZIP, under Images/plate.psd. This has been corrected as shown, and you can also see the elements I have removed, so use this image if your object removal skills aren't so hot (or don't if they're better).

The last thing we are going to do is create a couple of transparency mattes for the projected texture. We want to get rid of the sky in the photo. A second sky is an easy enough thing to drop in, even using sky tracer, or just a plain blue backdrop color, and doing so will give us a little more freedom of movement with our camera. We also want to clip around the edges of roofs, where certain background layers meet the sky and the details are both small and many. Also here we have a bush in the foreground, which is a difficult shape to model a match for, so we'll just be using a box with our clip map.

Clone the background layer three times, and select *Image>Adjustments>Desaturate* once on each copy to make

MAIN
ELEMENTSBACKGROUND
ELEMENTSFOREGROUND
ELEMENTS

USE DESATURATE TO CREATE THE THREE MATTE PLATES AS SHOWN



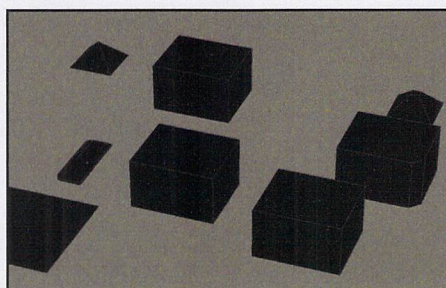
FLATTEN IMAGE WITH POLAR COORDINATES

them both grayscale. This next part is simple enough, so I won't go into too much detail, but by heavily compressing the levels, and using the Paintbrush tool, it's pretty easy to come up with these three mattes in a jiffy. Mine are Plate_TRN, Plate_BG_TRN and PLATE_FG_TRN.

Right, so onto the lightprobe. Load up Pic2 and Pic3, and using the Crop tool, chop them so as just the circle fits in perfectly. Now to make them flat for use as spherical image maps. Choose *Filter>Distort>Polar Coordinates*. Set it to be Polar to Rectangular, and hit OK. You should now have two flattened out bits of vista.

To put them together into a normal panorama simply requires a few steps through offsetting, copying, pasting, cutting apart, and sticking end to end. Again, I won't go into too much detail here, but it's easy enough to end up with something like this. My file: Images/Panorama.

The panorama serves for a couple of uses. Firstly, it allows us to perform global illumination of the objects that we are wanting to put against the background, plus it gives us an environment to use for reflections. Whilst reflections may not be absolutely necessary for organics, (although I used them in my render here instead of specularly) it will



CREATE A FEW PRIMITIVES IN MODELER

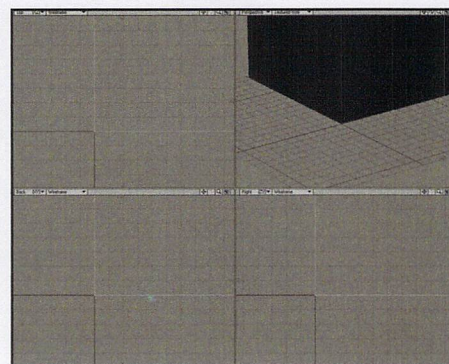
most definitely come into play if you want to do any kind of vehicle.

Right then, with all of the donkey work done, it's time to get into LightWave and put it all in place.

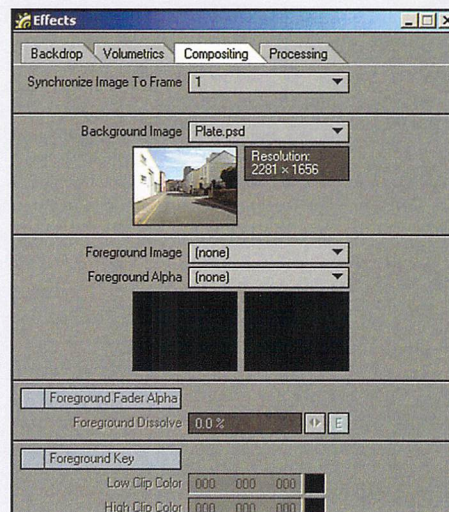
First, open Modeler and create a few primitives. Have a look at the scene you're working towards to see what basic primitives you are going to want. In this case, a few boxes, a pointy roof, and a flat-topped roof, as well as a couple of round-edged boxes for the pavements, and provide any blocking for the feet of our character. I also add a morph to the rooftop objects to allow me to mush them about a bit once in Layout if need be. These are my shapes here, and you can check out the objects in the objects folder, also.

Notice when I am creating these that I am positioning a corner at 0,0,0. This means that once I have my ground lined up in Layout, I can simply import the objects, set them to 0 on the Y, and then manipulate them on the X and Z-axis to line them up with the corner of a building before stretching them to fit the wall space.

Right, then. With all that out of the way, crack open Layout. The first thing we need to do is get the backplate



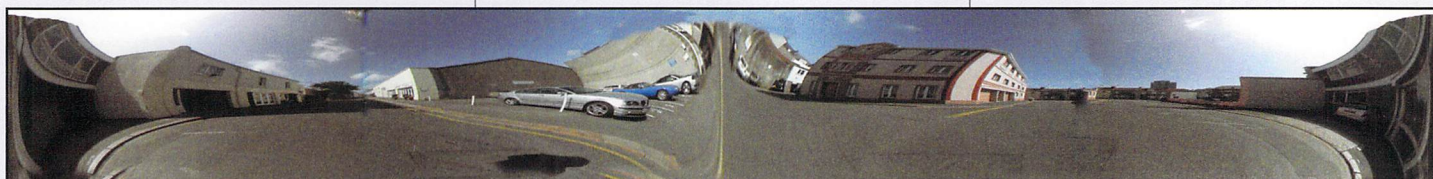
POSITION PRIMITIVE CORNER AT 0,0,0



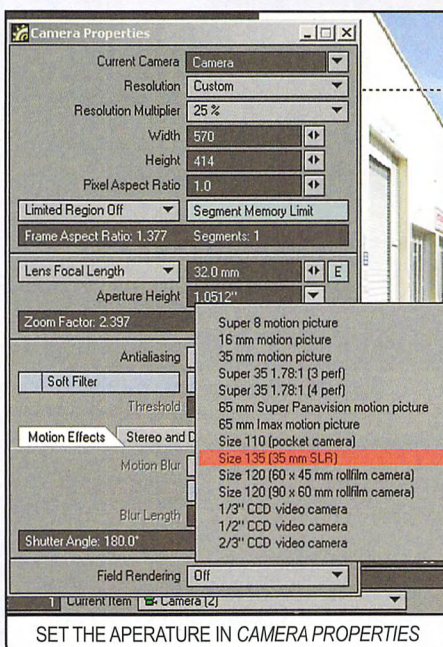
LOAD THE BACKPLATE IN LAYOUT

loaded and line up the ground. Go to the Image Editor and select Load, and choose the file Plate.psd. Now open the Effects panel and go to Compositing. Select the Plate image as the backdrop image and close the panel.

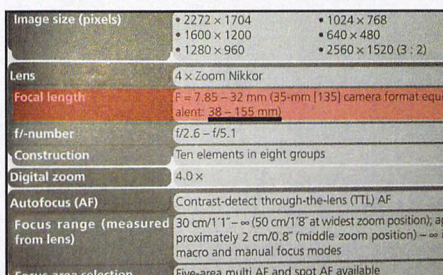
Now open the Display Properties. Make sure Grid is on, and make the size relatively small so as we have a fair density of lines to work with. Now change the Camera View to Background Image and close this panel. Next open up the Camera Properties and set the Resolution to the same as the image we are using, in my case 3840X2160, but you can change the Multiplier down to 25%. Now change the Aperture Height to



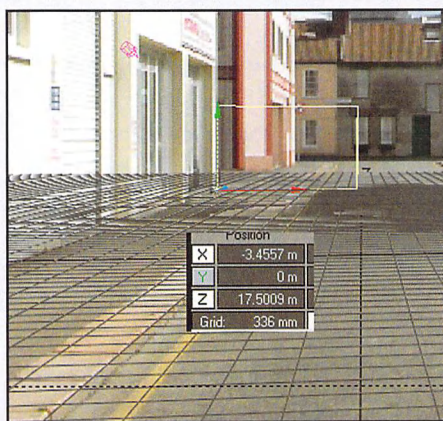
A SIMPLE CUT AND PASTE WILL CREATE THE PANORAMA AS SHOWN HERE



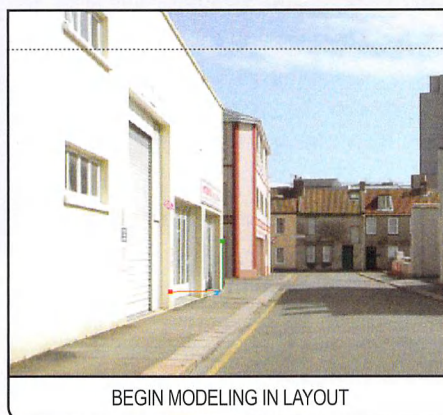
SET THE APERTURE IN CAMERA PROPERTIES



EQUIVALENT FOCAL LENGTH IS IMPERATIVE



BEGIN MODELING IN LAYOUT



BEGIN MODELING IN LAYOUT



WITH THE CAMERA AT SHOOTING HEIGHT LINE UP THE PERSPECTIVE OF THE GRID TO THE IMAGE

the 135 size (35mm SLR) preset, and the zoom level over to lens focal length, and enter a focal length of 32mm.

Now this part of setting the camera is so important if you are wanting to combine CG elements with a live plate. Pretty much all digital cameras and camcorders will have a small line somewhere in the specs section of the manual telling you what the camera's lens is equal to in 35mm SLR terms. Having this information allows you to set the identical lens parameters in LightWave, ensuring that the amount of perspective in the rendered CG elements will match those in the live image. You may notice that my camera manual states an equivalent focal length of 38mm, but I have set my LW camera to 32mm. This is because the adjustments made in Photoshop have effectively widened the field of view in the image. I have therefore started by setting my camera at 38mm, then nudged it down a little at a time until I got a perfect match for the retouched photo.

If you switch to your camera view, you should now see your plate image in the camera's viewport. First, raise the camera to 1.2m on the Y, our approximate shooting height. The next part basically involves manually nudging the camera's position

and rotation by eye, attempting to line up the grid, so as the perspective and view of the grid matches the ground in the image. If you're having difficulty, or just want to cut the crap, load up `ground_match.lws`.

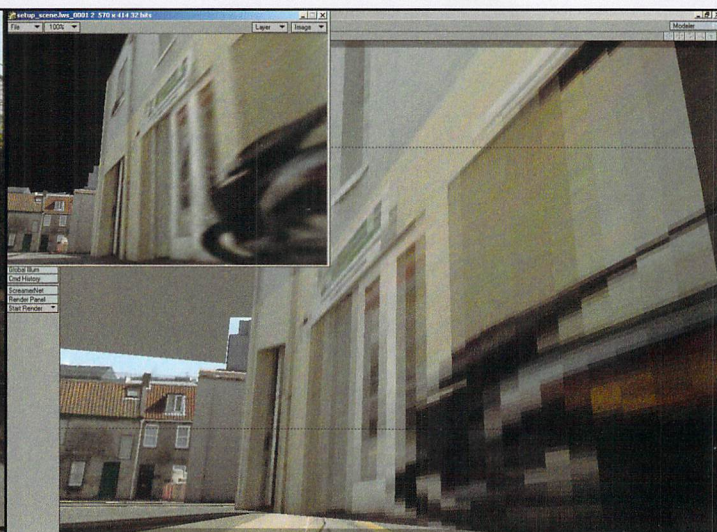
Now for the fun part; modeling in Layout. Bring in the first object, `basic_box.lwo`. We'll start with the easiest parts first. Moving the box using the X and Z handles only (you can click the Y in the bottom left hand corner to lock out translation on this axis if you want), move the box (and spin on its heading if necessary) until its pivot point sits on the corner of the bike showroom building. That's the big block one on the left.

Press h to switch to the Stretch tool, and pull on the handles to make the box fit snugly to the edges of the building. Since no building is as perfect (geometrically speaking) as a CG cube, you'll probably find you need to rotate the box a little on its HPB to get a perfect match. Don't worry if it goes over onto a bit of sky, as the clip maps will take care of all that.

Now all we do is continue to add more of our primitives, always keeping their pivot points on a corner facing us, and block out all of the objects in our image.



CONTINUE ADDING PRIMITIVES TO BLOCK OUT ALL OF THE OBJECTS



SWITCH TO CAMERA 2 VIEW AND YOU MOVE WITHIN THE IMAGE

Since the row of buildings at the back is reasonably far away, as well as the tower, we can just use two blocks to block the whole lot off, each with their own individual clip map. We use a different object here, so use `basic_box_bg.lwo` for these buildings, and use the `basic_box_FG` for the bush in the foreground. You can see the wire here for my setup, and see the scene, `Setup_scene.lws`.

Although for speed's sake I have chosen a pretty simple scene to do here, it is perfectly possible to do some very detailed backdrops using only a few different primitives, a clever morph or two, and the odd clip map. All you need is a picture of sufficient resolution to start with.

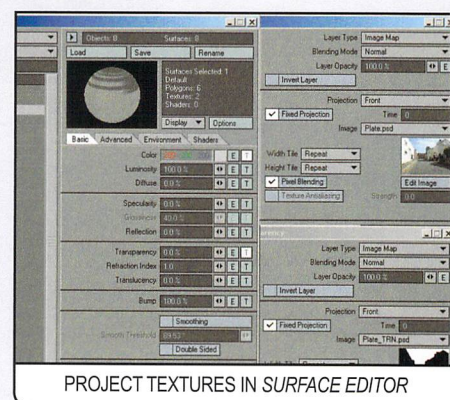
Now to project the textures. Firstly, clone your camera to create a second identical one. Open up the Surface Editor and select the surface for `basic_box`. Click on the Texture button for the Color channel. Make it an image map, select the plate image, change the Projection Mode to Front, and set the Projection Camera to be camera1. Now copy this texture, open up the texture for the Transparency channel, and paste it in. Change the image to the clip map we made for the main image; mine is `Plate_TRN`. Set the surface to be 100% Luminous with 0% Diffuse. Now copy

and paste this surface onto all of the other objects in the Scene Editor.

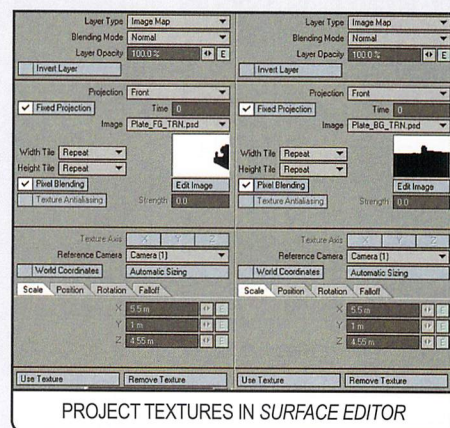
If you now disable the backdrop image in the Compositing panel, switch to camera 2 view, and start moving the camera2, you'll see that you can now move around inside the scene. OK, it looks a bit crap in OpenGL, but render off a frame and you'll see that the stretching and buckling of the textures is just an OGL affair. You'll also see that there are limits to exactly where you can place the camera; you can't, for instance go looking around a corner at a wall that was obscured in the original image. It does, however, give you a great deal of movement that would be unobtainable using a simple 2D pan and scan.

OK, lastly in our scene setup is to take care of those background and foreground clips, and drop in a new sky. Open up the Scene Editor, and go to the surface settings for the `Box_BG`. In the Transparency channel swap the image for the background buildings clip map; mine is `Plate_BG_TRN`. After that, go and do the same for the `Box_FG`, using the foreground (bush) clip.

If you hit F9 now, you should have everything but the sky. You can do your own sky however you want. I've included



PROJECT TEXTURES IN SURFACE EDITOR



PROJECT TEXTURES IN SURFACE EDITOR

`simpleshere.lwo`, which is a quick and cruddy thing, but it works just fine, so use that if you like.

OK, so onto the last thing: getting the panorama in for GI lighting and reflections without the ray trace time hit. Open the Image Editor, and load up the `Panorama.psd` image. Now go back to the



BY HITTING F9 YOU SHOULD HAVE EVERYTHING BUT THE SKY

Effects panel, and in the Background tab, select *Add Environment>ImageWorld*. Select the Panorama as the lightprobe image. Now you want to be sure that the probe image is in roughly the same place as the objects in your scene, that the Sun, for instance, isn't on the opposite side than in the backdrop. You can just add ImageWorld to a blank scene, and try it at different rotations until you find it, but in this case if you're using my images, the correct setting is 90 degrees.

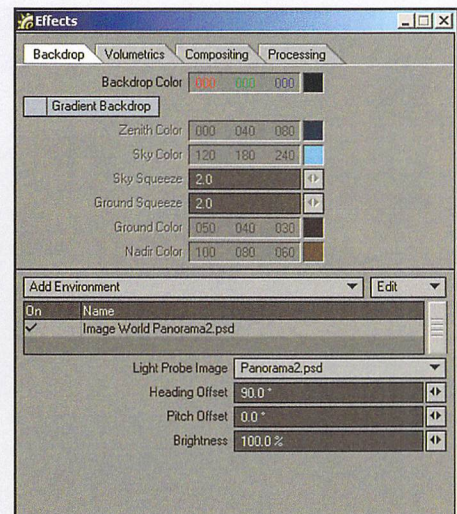
Now to make sure render times will be kept down, open the properties for any object in the scene and under the Lights tab, check to exclude Radiosity, and carry on to do this for all the objects. When you render another object in this environment, you can use radiosity in Backdrop Only mode for super fast GI rendering that will match the environment perfectly. Well, perfectly enough at any rate. Also, if any objects are going to be reflective, you can set them to reflect backdrop only in the Advanced tab of the Surface Editor, which runs a lot quicker than ray tracing.

And that's about it for the camera mapping, everything is set up and done. You

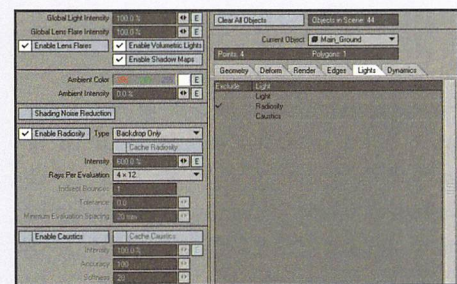
can move camera 2 around the scene, zoom in, and so forth, and effectively have a fully photorealistic environment to drop your creations into.

So let's get onto a bit of creation dropping. I have chosen to drop in a dino; you can find the scene as *Setup_scene_rex*. Now you can go ahead and drop in whatever you want, and do whatever kind of camera move you want, but I'll talk you through a couple of points here. Take a look at the rendered animation for this scene, it's in the *cammazip*.

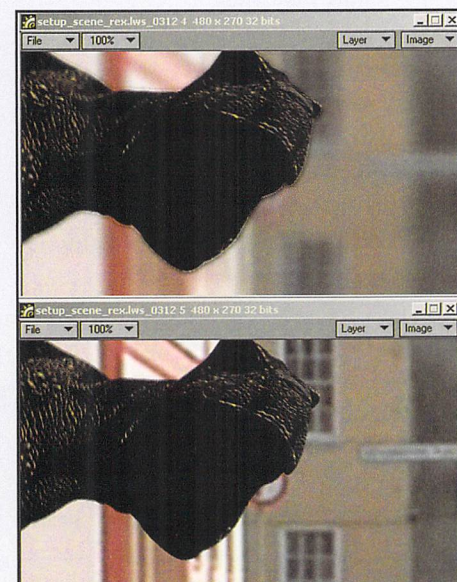
One of the things that I have been able to do is use a shaky, zooming camera that would be very difficult to track from live footage; also the motion blur of the rendered backdrop, and the dinosaur will also match. When I zoom right in on the dino's head, you can see in Layout that the backdrop is starting to become a bit pixelated, and you can see why since the area in question is so small in the original image. Because I have zoomed in rather than moved in, I can use depth of field to my advantage here and blur out the background more than in the wide shots, which is in keeping with what happens with a real zoom lens.



IN EFFECTS ADD ENVIRONMENT>IMAGEWORLD

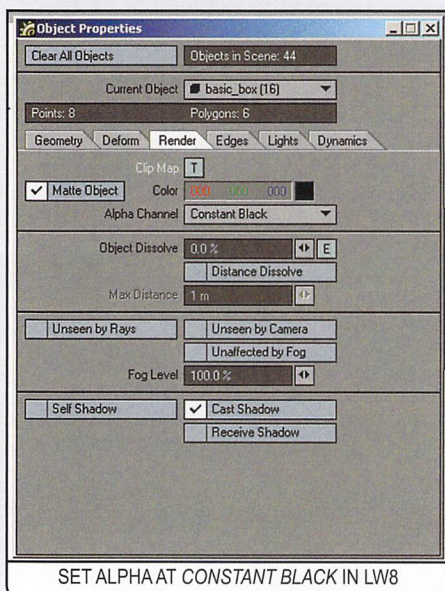


EXCLUDE RADIOSITY ON EACH OBJECT



USE DEPTH OF FIELD TO MIMIC A ZOOM LENS

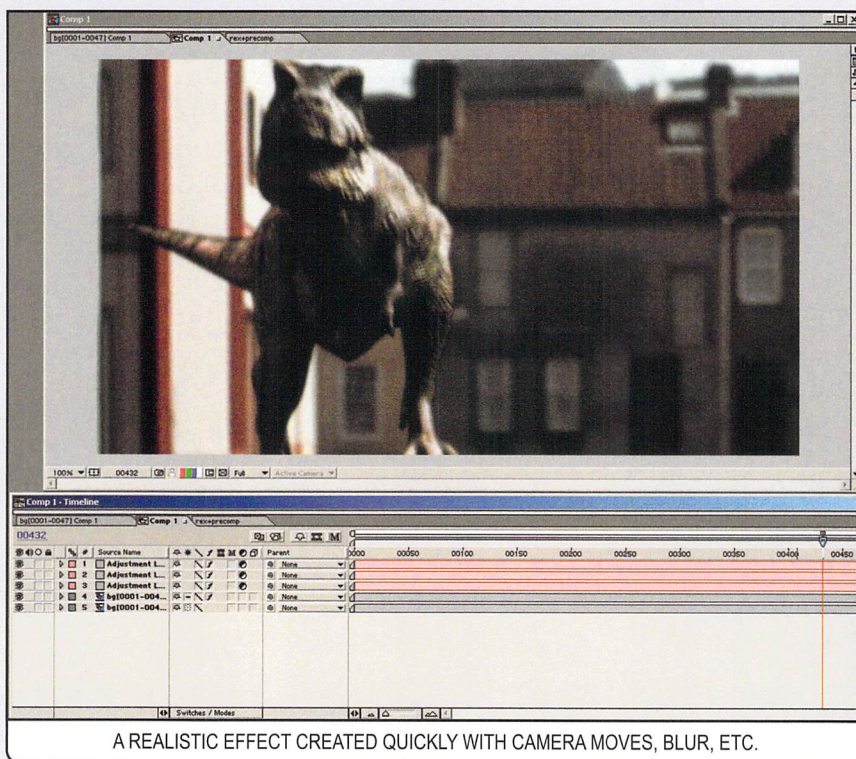
One thing that you will want, though, is for the CG element to cast a shadow onto the background. Achieving this is simple enough. If you saw my last piece on compositing rendered elements to-



SET ALPHA AT CONSTANT BLACK IN LW8

gether, it'll be super simple. Perform one render of just the background, without the dino, and another of just the dino. For this second scene you'll want to keep all of the camera mapped cubes, but set them to be black matte objects, unseen by alpha in LW7.5, and with alpha at Constant Black in LW8. This will cut away from the dino render where the buildings overlap him.

Now for the shadows. Starting with our full scene, go into the Surface Editor and change the surface of all the camera mapped objects. The new surface should be black, 0% Luminosity, 100% Diffuse, with the color texture removed. In the Advanced tab, set the

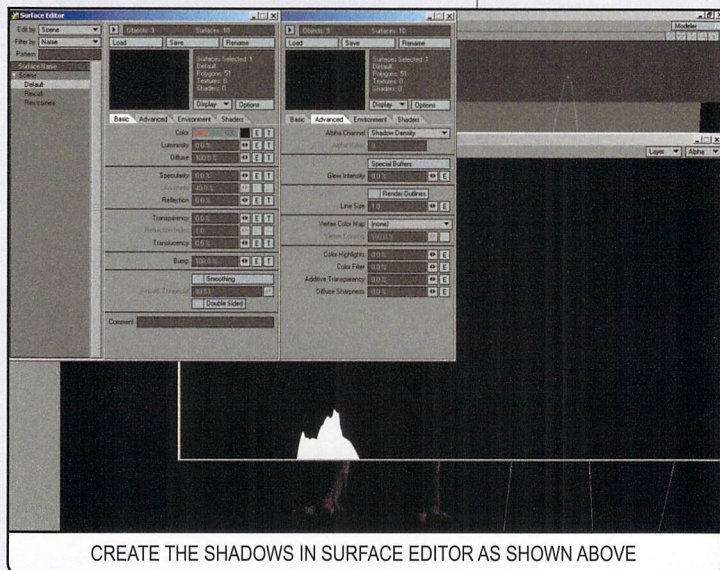


A REALISTIC EFFECT CREATED QUICKLY WITH CAMERA MOVES, BLUR, ETC.

alpha channel to be based on Shadow Density. Set the dino object to be unseen by camera and render. The frame will come out black, but if you look at the alpha you'll see that there are white patches where the shadows fall.

From here, simply combine the three renders in the compositor of your choice, color correct to taste, bit of blur, dash of noise, and there you have it. A decent, realistic looking effect, created

in very little time, complete with camera moves, blur, the lot. If you look in the cammap_render.zip, you'll find an After Effects file, and a few renders of the different pieces of the render I have used. I have rendered the dino using multipass rendering to help get better realism in the final piece. Have a look at what these are and how I have assembled them to get a start of an idea about multipass rendering, and next time, I'll wrap up this whole business of splitting and compositing renders with a nice in-depth look at using multipass rendering to really make your images pop. Until then. ■



CREATE THE SHADOWS IN SURFACE EDITOR AS SHOWN ABOVE



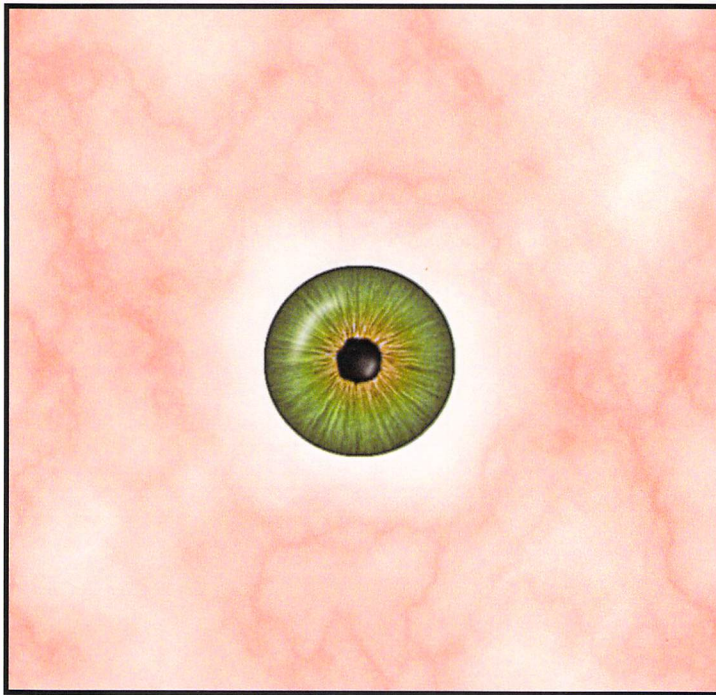
CRAIG MONINS HAS BEEN A DINOSAUR LOVER SINCE HIS EARLIEST REMEMBERED CHILDHOOD. BY THE AGE OF FIVE HE COULD NAME TENS OF SPECIES, AS WELL AS THEIR HEIGHTS, LENGTHS, WINGSPANS, ETC. ONE DAY HE HOPES TO DREAM UP A DINOSAUR MOVIE THAT HASN'T ALREADY BEEN DONE TO EXTINCTION, BUT IN THE MEANTIME YOU CAN VISIT HIM AND HIS WORK AT WWW.REBELHILL.NET.

BY BOB CALANDRIELLO

QUICK MEDICAL FIXES:



TWO TUTORIALS FOR YOUR HEAD



TUTORIAL #1 CREATING AN EYE TEXTURE IN PHOTOSHOP

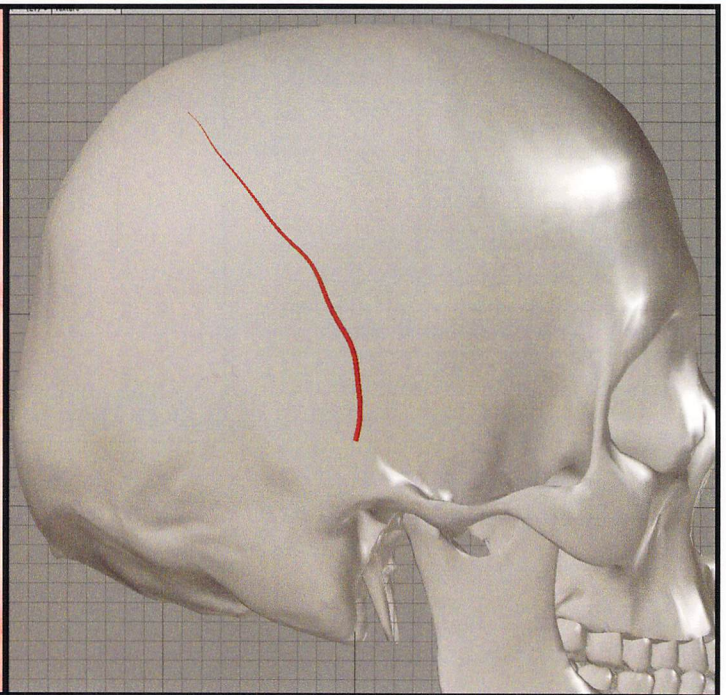
CREATING AN EYE TEXTURE IN PHOTOSHOP.

I've seen dozens of tutorials on creating the Iris of the eye, but haven't seen many on creating the tiny red arteries in the white of the eye, other than using a Photoshop brush to paint each artery in individually. This works very well; however, it can be time consuming. In this lesson, we'll create the small arteries within minutes without using any type of brush.

- Create a 5 x 5 inch, RGB document in Photoshop.
- Set your Foreground Color to white, and your Background Color to black.
- Select your Radial Gradient tool and drag from the center to a corner. You should have a document that looks like [Figure 1](#).
- Select "Difference Clouds," which is located under *Filter > Render*. You can see how the "arteries" will appear. You

can apply this numerous times until you get the artery pattern of your preference, which I've done in [Figure 2](#).

- Set your Foreground Color to a bright red, and select "Fill" under the Edit menu. The Fill Dialog box will appear; set the "Use" to Foreground Color and set the "Mode" to Lighten and Opacity to 100% ([Figure 3](#)). You will see your image turn a bright red ([Figure 4](#)). We will now tone this down.
- Select "Levels," which can be found under *Image > Adjustments*, drag all the sliders to be approximately the same as seen in [Figure 5](#), and watch the dark red disappear and the small red "arteries" appear. You can adjust the levels to any amount of red you prefer, depending maybe on how much binge drinking your subject did the night before. After you've adjusted the levels, you can also adjust the overall color using the Curves scale, which can also be found under *Image > Adjustments*.



TUTORIAL #2 CONFORMING ONE SHAPE TO ANOTHER

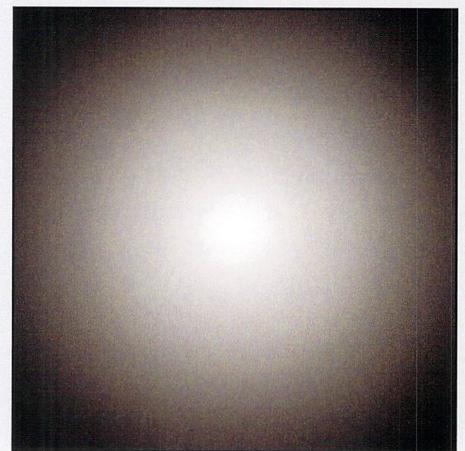


FIGURE 1 – RADIAL GRADIENT BACKGROUND

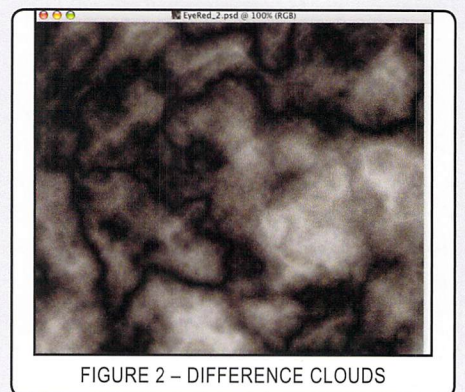


FIGURE 2 – DIFFERENCE CLOUDS

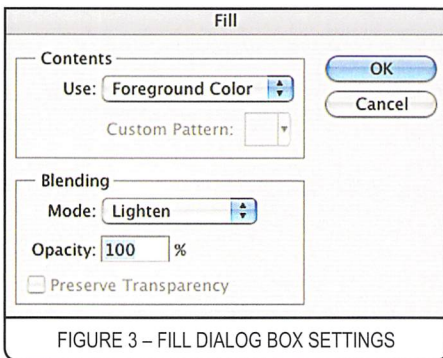


FIGURE 3 – FILL DIALOG BOX SETTINGS

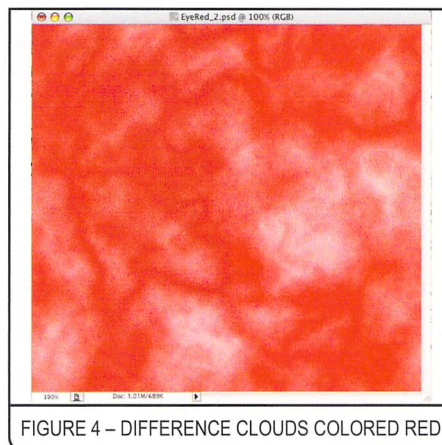


FIGURE 4 – DIFFERENCE CLOUDS COLORED RED

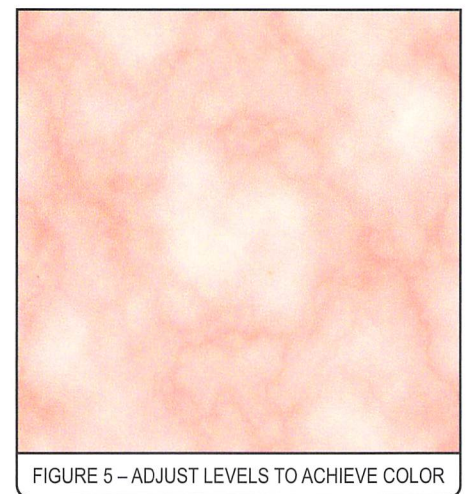


FIGURE 5 – ADJUST LEVELS TO ACHIEVE COLOR

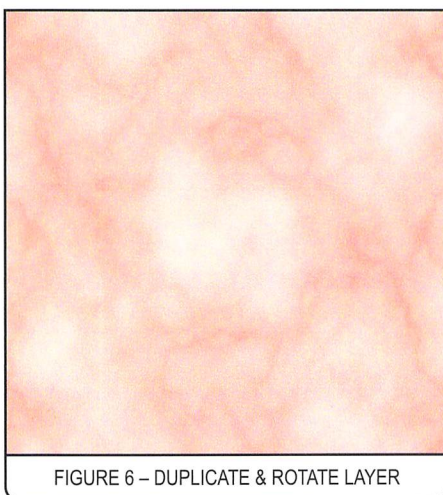


FIGURE 6 – DUPLICATE & ROTATE LAYER

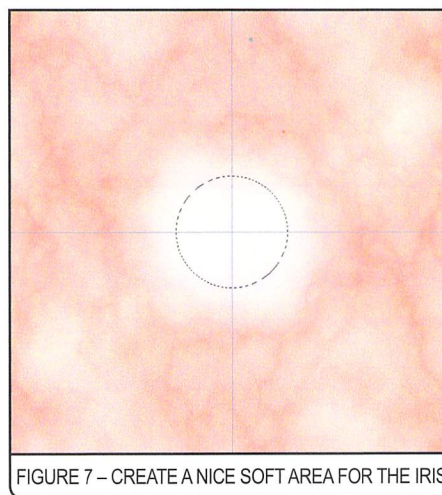


FIGURE 7 – CREATE A NICE SOFT AREA FOR THE IRIS

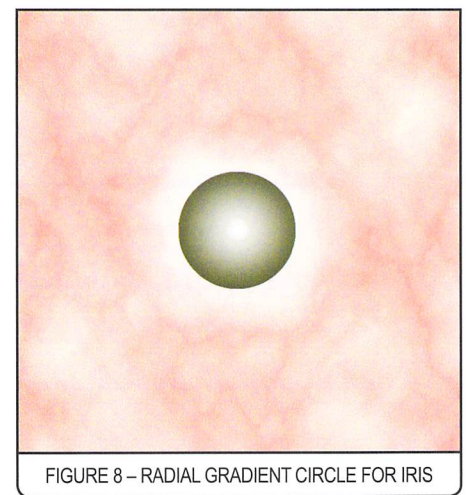


FIGURE 8 – RADIAL GRADIENT CIRCLE FOR IRIS

- Next you can duplicate the layer, rotate it 180 degrees, and lower the opacity to view the background layer arteries (Figure 6).
- Next, create a new top layer, and draw a circle with your Circle Marquee tool, feather 50 pixels, and fill it with white. Fill with white four or five times, and set the layer opacity to 80% to make a nice, soft area for the Iris (Figure 7).

Now that we've finished the white area of the eye with the red arteries successfully, we can continue on to create the Iris. I'll create a dark green Iris, but you can create whatever color you'd like, since the following will teach you just one of the many techniques of creating an Iris texture in Photoshop.

- Create a new top layer and create a circle on the new layer with the Circle Marquee

tool. Next, set your Foreground Layer to white and your Background Layer to dark green or to another color of your choice. Fill your selection as shown in Figure 8 with the radial gradient tool.

- Now create a new top layer and make a white circle approximately 75% the size of the first circle. Next, select the filter "Add Noise" (Filter > Noise > Add Noise) with the following settings – 60% – Uniform – and turn Monochromatic ON (Figure 9).
- Select Radial Blur (Filter > Blur > Radial Blur) and enter the settings as shown in Figure 10. Next we will need to make this layer a bit darker, so pull up your Levels adjustment dialog box again and drag the marker shown in Figure 11 over to your right until the first input level is 112. You can also apply the Ripple filter

(Filter > Distort > Ripple) as an extra option to make the lines in the eye a bit wavy.

- Select "Fill" under the Edit menu, and fill it with the following settings as seen in Figure 12. After you've set the Fill feature, Gaussian Blur the layer with a 1-pixel blur setting. We will now use the "Curves" to darken up the layer even more. I prefer color correcting as I go along, because sometimes you can blow out the image if you adjust the levels or curves all at one time. Select "Curves" (Image > Adjustments > Curves) and enter the data as shown in Figure 13 to darken it up.
- Duplicate the layer you've just created, and rotate it 180 degrees. While still on this layer, create another Circle Marquee selection approximately the same size as

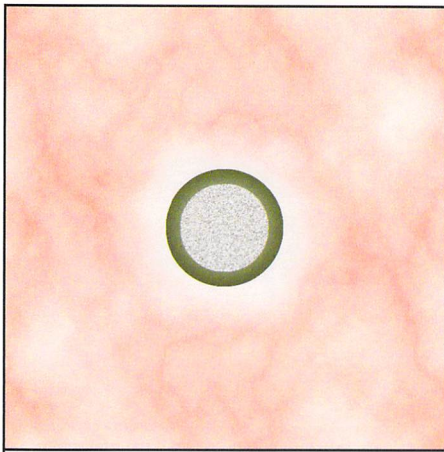


FIGURE 9 – ADD NOISE TO THE CENTER CIRCLE

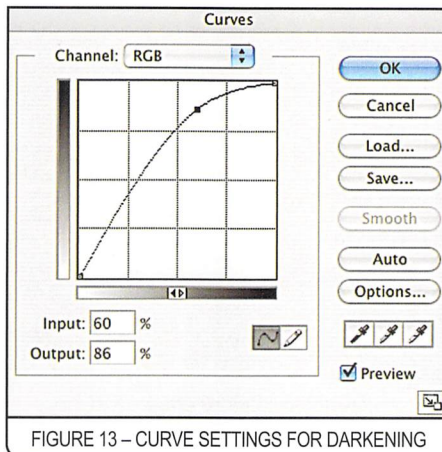


FIGURE 13 – CURVE SETTINGS FOR DARKENING

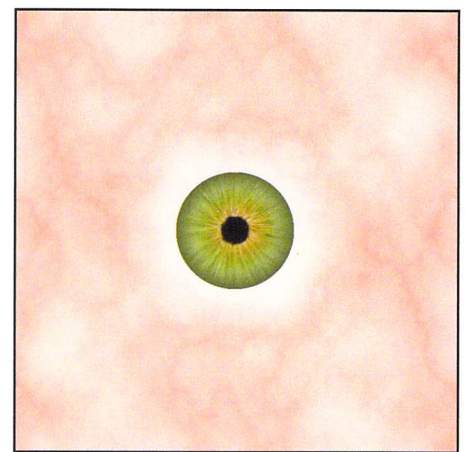


FIGURE 17 – SMUDGE EDGES OF BLACK PUPIL

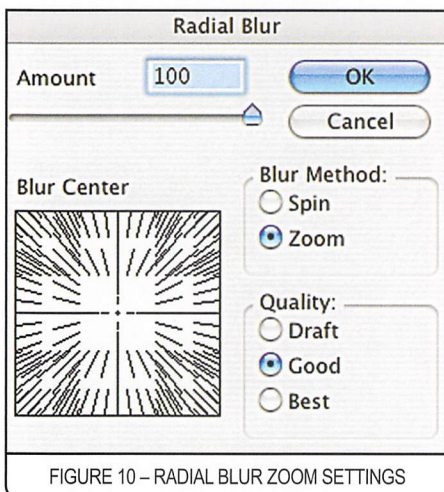


FIGURE 10 – RADIAL BLUR ZOOM SETTINGS

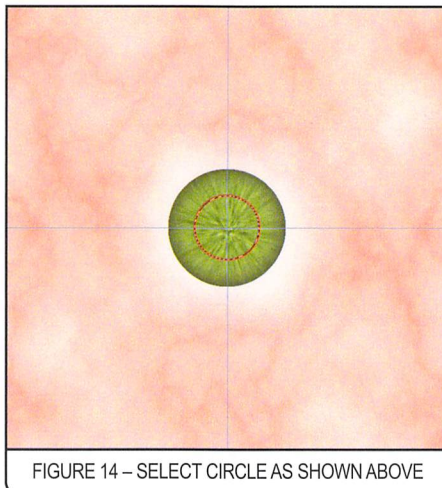


FIGURE 14 – SELECT CIRCLE AS SHOWN ABOVE

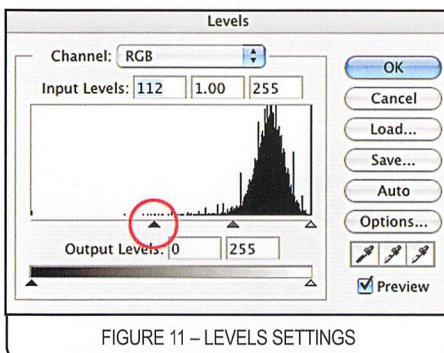


FIGURE 11 – LEVELS SETTINGS

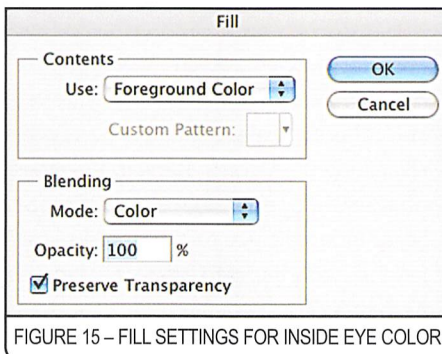


FIGURE 15 – FILL SETTINGS FOR INSIDE EYE COLOR

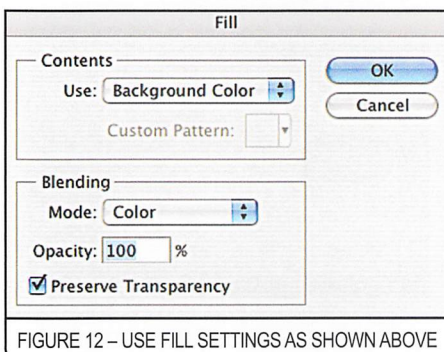


FIGURE 12 – USE FILL SETTINGS AS SHOWN ABOVE

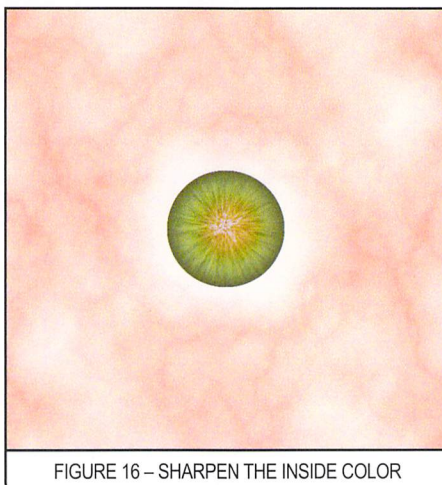


FIGURE 16 – SHARPEN THE INSIDE COLOR

in [Figure 14](#), feather 8 pixels, then inverse, delete and deselect. This will be the layer for the inside color of the eye.

- Set your Foreground Color to a yellow-orange, and fill that layer you've just duplicated in the previous step with the settings shown in [Figure 15](#). You will now have the inside color of the eye. You can then adjust the inside color with the levels and/or curves to your liking, and you may want to sharpen up the inside color with the Unsharp Mask tool (*Filter > Sharpen > Unsharp Mask*). You can see my example in [Figure 16](#).
- We will now create the pupil, so make a new top layer and create a small black circle, and Smudge the edges slightly as seen in [Figure 17](#).
- For the final steps, place a thin green stroke (I used a 2-pixel stroke) around the Iris, and Gaussian blur the stroke slightly. Lastly, add a new layer with white highlights by drawing some white shapes, blurring them and lowering the layer opacity.

Save a flattened copy as a jpeg or targa file, and you have yourself a final eye texture ([Tutorial #1 Title Image](#)). At this point, you can also lighten or darken the overall file in Photoshop with the Levels or Curves adjustment tools.

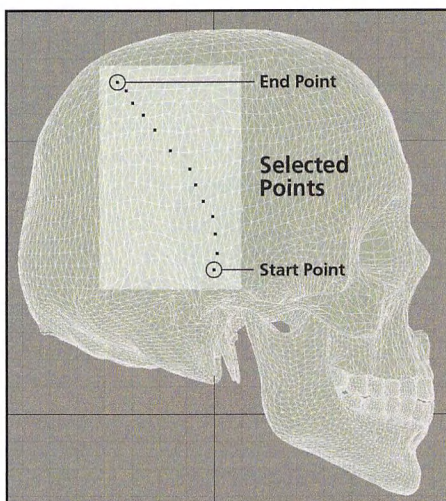


FIGURE 1 – SELECT POINTS ARTERY WOULD FOLLOW

CONFORMING ONE SHAPE TO ANOTHER...

For this lesson, we will use the model in the Objects directory > Humans > Skull_High.lwo.

On a recent project, I was asked to show the main arteries that run on the outside of the skull. Here is a technique that can be used on various projects in which one shape needs to conform to another.

- Select the points on the skull (in the left view) which an artery would follow as seen in [Figure 1](#). Copy and paste those points onto a Background Layer. Select the points in order from start to end and click “Control M” to create a path of the selected points.
- Create a 10-sided disc on a Foreground Layer and position it at the beginning of the newly created path ([Figure 2](#)). Name the disc “Artery” and color it red.
- Under the Multiply tab, click “Rail Extrude.” Select “Uniform Lengths,” turn the Oriented button ON, enter 20 for the number of segments, and click OK. You now have an artery that conforms to the shape of the skull ([Figure 3](#)). You can also move it up and left slightly, since half of the artery is in the skull ([Figure 4](#)).
- From here we will need to taper the tip. Select most of the end segments as shown in [Figure 5](#). Under the Modify Tab

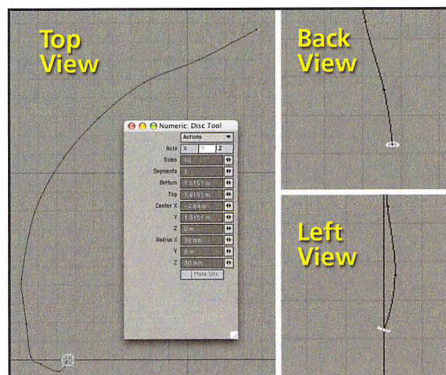


FIGURE 2 – DISC ON NEW PATH

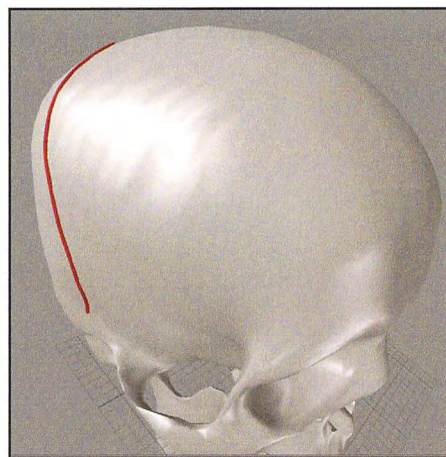
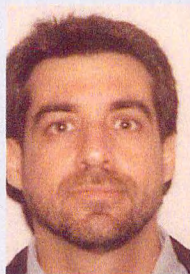


FIGURE 3 – ARTERY CONFORMS TO SKULL

> *Transform* > click “Smooth Scale,” and enter negative (-) 2mm. Next, deselect the segment area as shown in [Figure 6](#), and Smooth Scale negative (-) 2mm the remaining polygons. Repeat the steps of deselecting each segment and Smooth Scale until you get to the tip and you’ll have a nicely tapered artery ([Tutorial #2 Title Image](#)).

You can now start selecting more points on the skull to create more and more arteries. ■



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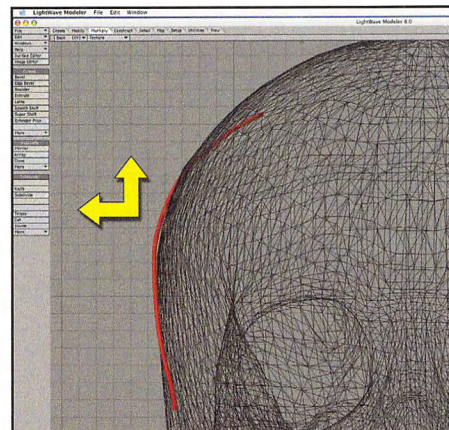


FIGURE 4 – MOVE ARTERY UP & LEFT

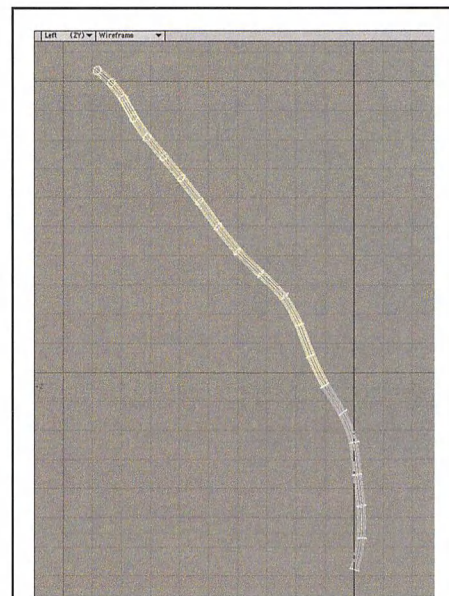


FIGURE 5 – SELECT END SEGMENTS AS SHOWN

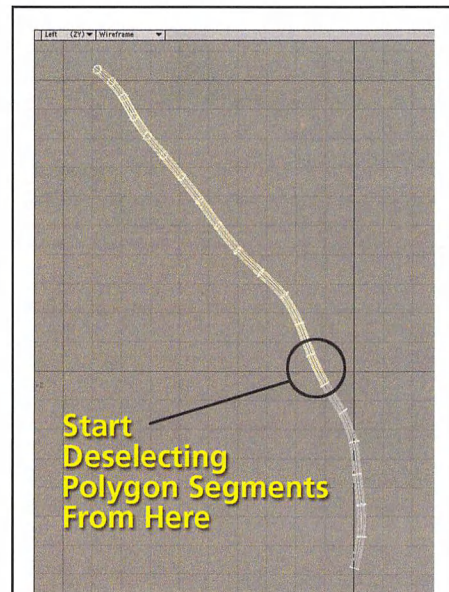


FIGURE 6 – DESELECT SEGMENTS AS SHOWN

YOU WANNA BE A CONTENDA? TURN OFF THE COMPUTER!

If you're a serious artist; that is, if you are serious about wanting to learn how to light in CG, the first thing you're going to have to accept is that you will never learn what you need to know by sitting at a computer terminal. So turn the cursed thing off and go outside.

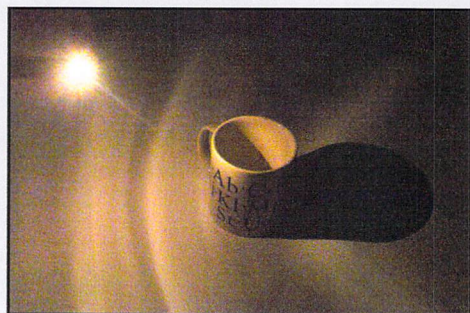
noses, fabrics and whatnot? These were all studies to discover just how the shapes worked, how the anatomy functioned, and most especially, how light and shadow fell. If you want to place yourself at the top of the skills ladder, thereby making yourself a valuable and sought-after commodity, you

*CREATING REALISTIC
SHADOWS IS AS SIMPLE
AS OBSERVING HOW
NATURE CREATES THEM*

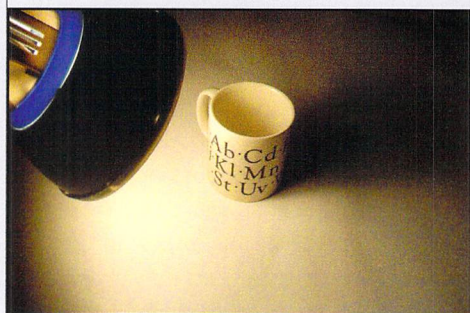
All visual artists learn their art by observations of the real world. Painters, sketch artists, photographers, designers, sculptors, and yes, even animators, learn through hours and hours, days, weeks, months — even lifetimes of study. Have you ever looked through da Vinci's many studies? All those pencil sketches of hands,

may as well brace yourself and settle in for a long, long learning curve.

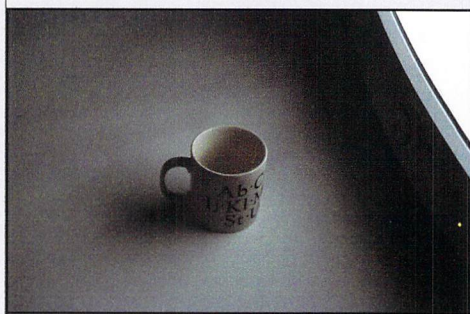
Fortunately, though, getting started doesn't take years. There are a few basic skills and principles that will get you going — get you into a mental place from where you can conduct your studies with confidence and from a frame of reference.



SMALL LIGHT SOURCES CREATE HARSH SHADOWS



MEDIUM LIGHT SOURCES CREATE SOFTER SHADOWS



LARGE LIGHT SOURCES CREATE DIFFUSED SHADOWS

Lighting skills in the computer world are split into two legs. First, you need to understand how real light works in the world. If you don't have a totally solid understanding of the behavior of real light, you'll never make it as a lighter. Second, you have to understand the strengths and weaknesses of all your lighting tools...and believe me, there are a lot more weaknesses than strengths.

Once you have both legs under you, and they're solid and strong, you can start walking. In other words, once you understand exactly how your tools work and exactly how real light works, you can get busy designing all the hacks, fakes and tricks you'll need to make your lighting look real. You can start that lifetime of studies making beautiful lighting in a CG world that's desperately seeking it.

LEG 1: LIGHT IN THE REAL WORLD

Light in the real world is actually quite simple and follows a very few easily observable rules. This is because all real light sources behave exactly the same — it's the computer light sources that behave strangely and unnaturally...but we'll get to that in the next section.

First of all, every light source in the world has a volume, whether it is a tiny Light Emitting Diode, a household lightbulb, a nuclear explosion, or a Red Giant Sun larger than our Solar System. Volume exists. This is an important point because it seriously affects how shadows look and behave.

SMALL LIGHT SOURCE

When a flashlight with a tiny lightbulb illuminates the scene, the shadows diverge from the radius (the light source) and are hard-edged. This looks similar to LightWave's ray tracing.

MEDIUM LIGHT SOURCE

When a desk lamp is used, it is easy to see how the shadows become softer.

LARGE LIGHT SOURCE

When a large light source like a computer monitor is used, the shadows become very soft. The monitor is so much larger than the cup that the light wraps around behind, making the shadows seem to converge.

Notice that in all cases, the shadows are sharpest near the object that is casting them.

Second, light is composed of waves (or waves of particles, depending on who you talk to), which means that all light radiates outward from points of origin. For example, every infinitely small luminous point on the Sun is radiating light in all directions. So you have uncountable trillions of points on the face of the Sun, or on the face of a lightbulb, emitting light omni-directionally. This is true of every light source, regardless of size.

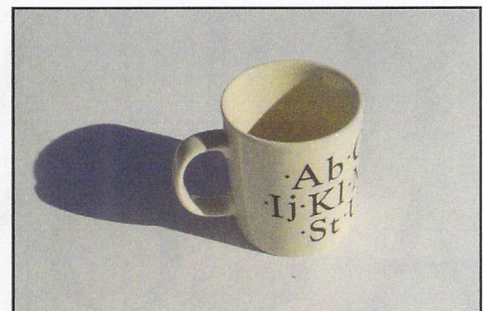
The first behavior (the physical volume of a light source) and second behavior (the fact that light is radiated from every point on the volume) give rise to a third behavior. That is the behavior of shadows. All shadows behave exactly the same, in that the further the shadow falls from the object casting it, the softer the shadow becomes.

SUN & SKY

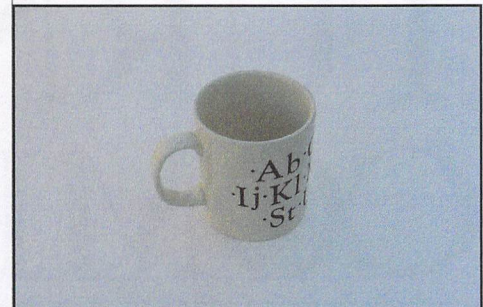
This is a simple outdoor shot illuminated by only skylight and sunlight. Note that the sun shadow is very sharp near the object and slightly soft at its furthest point from the cup.

SKYLIGHT

This is the same image as above, but with the sunlight blocked out. Note that the sky is such an enormous light source that



SUN & SKY – SHADOWS ARE SHARP, THEN FADE



SKYLIGHT – ENORMOUS LIGHT ELIMINATES SHADOWS

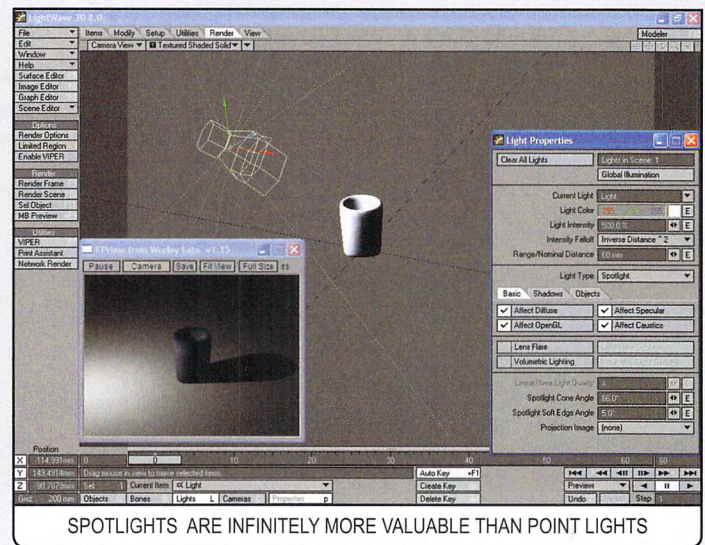
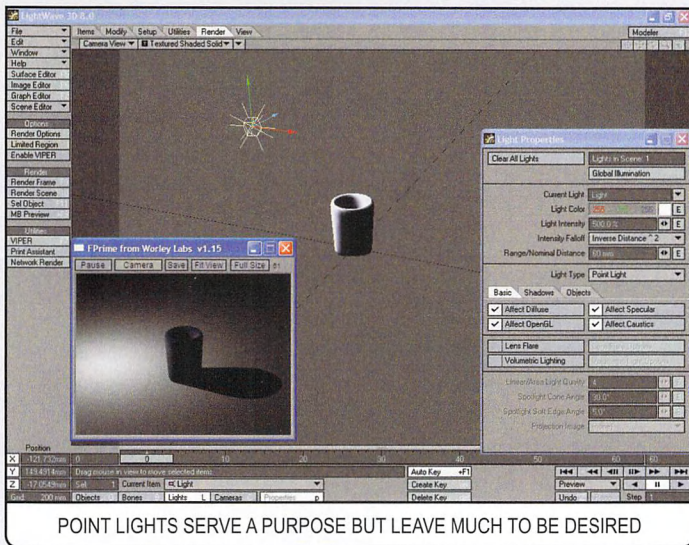
there are no shadows visible around the outside of the cup, since skylight is filling in from all directions, and there are soft shadows within the cup.

As another example, a chair leg sitting on a floor casts a shadow.

Where the chair leg touches the floor, the shadow is very hard-edged — very sharp. This is because the contact point of the chair leg and the floor are the focal point of the light "rays." Further away on the floor, the shadow has become softer.



SKYLIGHT – ENORMOUS LIGHT ELIMINATES SHADOWS



This happens because light is composed of radiating waves. The larger the light source, the softer the shadow will become — in other words, if the light source is 1mm in diameter, the shadow 1 meter away from the chair leg will be quite hard. If the light source is 100mm in diameter, the shadow 1 meter away from the chair leg will be softer.

There are many other light behaviors we could discuss, but these three are the crucial ones that will really help your lighting. The reason you need to understand and accept these behaviors is that most of your virtual, computer-based lights don't obey them, but you have to find a way to MAKE them look like they do.

Probably the best way for you to learn and understand these behaviors is to spend time observing them. Go outside and watch shadows. Look at the shadows on your desk when you're at work. What kind of shadows do you get from a computer monitor? What kind from a tiny halogen lightbulb? Or the Sun? Or on a cloudy day? Yes, the clouds on a cloudy day are the light source. They're a really, really big light source. What are the shadows like?

LEG 2: LIGHT IN THE COMPUTER

In LightWave 3D [8], there are few choices when it comes to lights that behave naturally. Let's discuss each of the light

types and cover why each of them does not obey our three main rules above.

POINT LIGHTS

Point lights can be quite handy when it comes to dropping in a highlight or faking a radiosity bounce, but as a primary light source, these puppies leave much to be desired. Why? Let's run them up against the three rules.

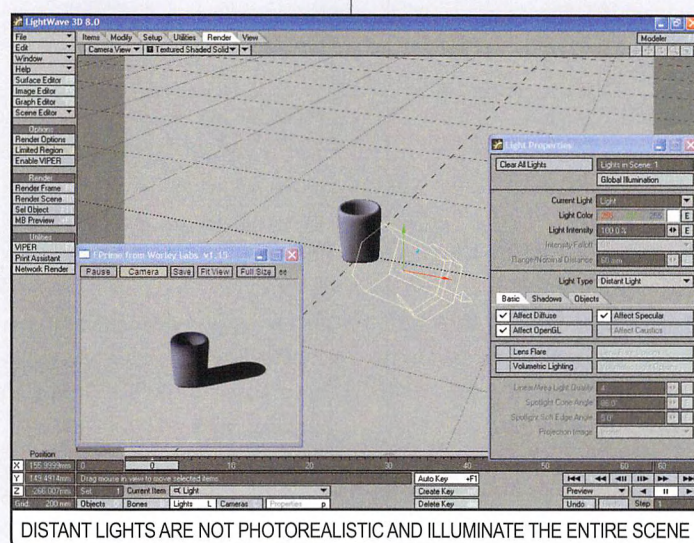
1. Volume. Point lights have no volume. They emit light "rays" from a single, non-dimensional point in space.
2. Waves. Point lights do not emit waves of light. They emit "rays." "Rays" are calculated by tracing a straight line from the light source to

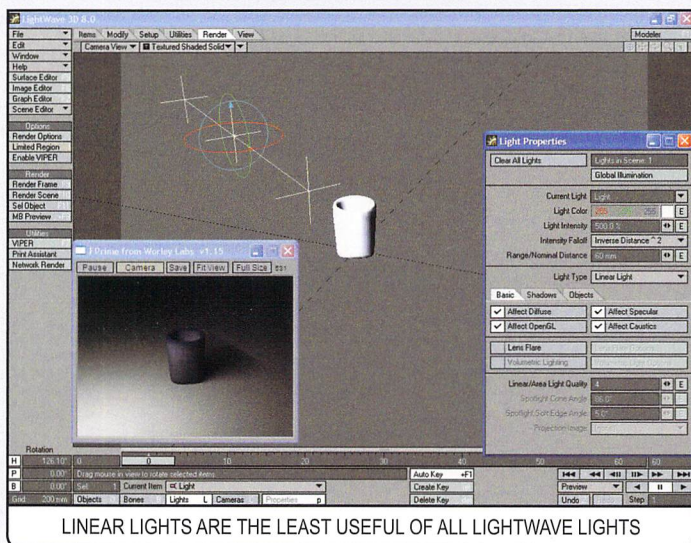
the first available surface. It's a cheap way to calculate illumination, but not very accurate.

3. Shadows. Shadows from point lights are hard. They're hard near the object casting the shadow. They're hard far away. Why? Because the point light does not obey our first law of light behavior. It has no volume, and therefore no surface area from which to radiate light.

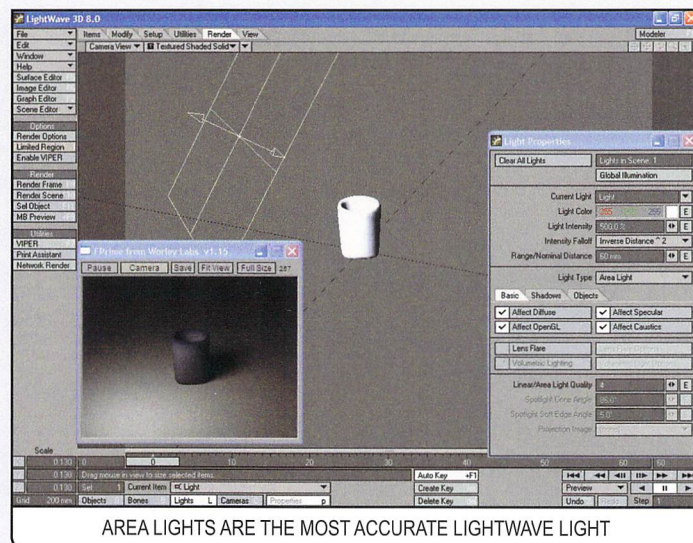
SPOT LIGHTS

Spot lights behave exactly the same as point lights with two and only two exceptions. You can confine the direction of illumination with a light cone, and you can use Shadow Maps instead of ray traced shadows. These are two very im-





LINEAR LIGHTS ARE THE LEAST USEFUL OF ALL LIGHTWAVE LIGHTS



AREA LIGHTS ARE THE MOST ACCURATE LIGHTWAVE LIGHT

portant distinctions, because they make the spotlight infinitely more versatile and valuable than the point light. You see, a spotlight can do everything a point light can do and more.

1. *Volume*. Spotlights also have no volume and emit "rays" from a single, non-dimensional point in space.

2. *Waves*. Actually, none of the LightWave lighting tools emit waves of light energy.

3. *Shadows* come in two types: ray traced like all the other lighting instruments, and shadow mapped, which is a cheap way of taking a snapshot of the shape of an object from the light's point of view (like a silhouette), and then casting shadows based on that shape. That certainly ain't how real light works.

DISTANT LIGHTS

Distant lights are the second least useful lighting instrument in the toolbox. This is mainly because they are designed to emit parallel rays of light in one direction. There is no boundary to the light, in other words, a single distant light will illuminate the whole scene, unlike a spotlight, which is limited by a light cone. Distant lights were designed to mimic the behavior of sunlight, but as we know, sunlight does not come in

all-parallel beams of light. This severely limits the use of distant lights in lighting scenarios in which photorealistic shadows are crucial.

1. *Volume*. Distant lights "sort of" have volume, in that the light source is infinitely broad, but is not truly voluminous, in that every point on the virtual "surface" of the light does not emit light omni-directionally.

2. *Waves*. Nope, not waves. Rays.

3. *Shadow*. Ray traced shadows. In this case, since all the light rays are parallel, all shadows from the distant light will not only be perfectly hard, but will also be the exact size of the shadow-casting object.

LINEAR LIGHTS

Linear lights are the least useful of all lights in LightWave. They are intended to mimic the behavior of lights such as fluorescent tubes. The problem is that since linear lights are measurable in only one axis, the shadows will only soften along one axis. You end up with shadows that are soft along one axis and hard along the other. This is very strange looking, indeed.

1. *Volume*. Once again, this falls into the "sort of" category. Volume is de-

fined by measurable dimension. Linear lights only measure in one direction, so there's no real volume here. (note: if you want linear lights to work really well, you need to make a cluster of them all together to simulate volume) IMAGE.

2. *Waves*. Ray traced, sorry.

3. *Shadow*. As mentioned before, the shadows are only soft in one axis, resulting in very strange looking shadows.

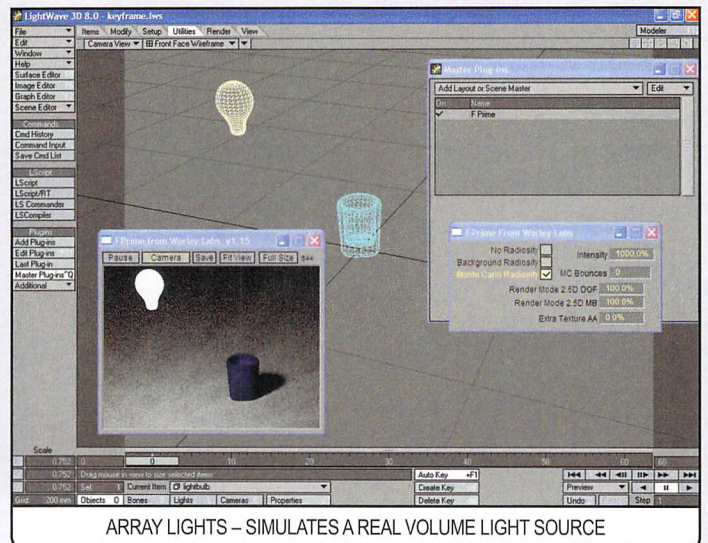
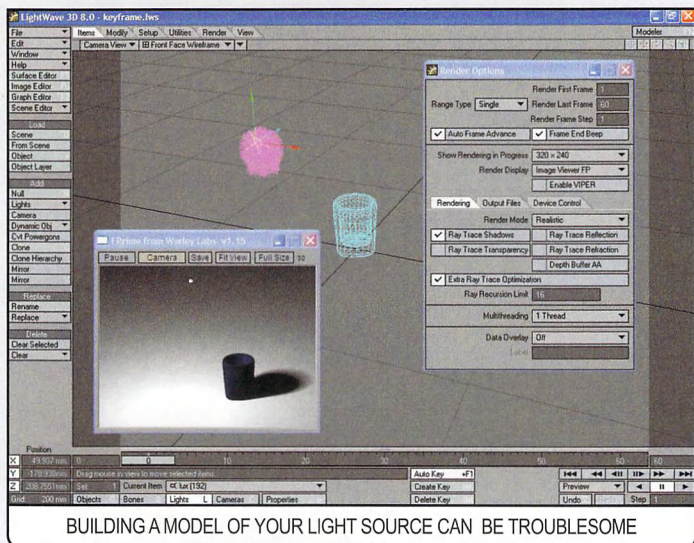
AREA LIGHTS

Area lights are, by far, the most physically accurate lighting instruments in LightWave. Since area lights are measurable in two axes, shadows will be soft and natural. The only thing that could make an area light better would be a third dimension, but that multiplies render times, so perhaps we should just be happy with the tool we have.

1. *Volume*. Almost. Two dimensions are not as good as three, but a million times better than one or none.

2. *Waves*. Nope, ray traced shadows only, but they work here because of the shape of area lights.

3. *Shadows*. Beautiful, believable shadows.



WHAT ARE WE TO DO?

If we really need three-dimensional lights, we do have a couple more options, although they can be pretty expensive to render.

For the first option, simply build a model of your light, for example, a lightbulb, make the surface luminous, and apply radiosity. The luminous texture will actually emit light into the scene; however, render times are likely to be enormous and you may have trouble getting the render quality you want.

The second option is to build light arrays in three-dimensional space. This technique can solve the very worst lighting needs and doesn't require radiosity to render. It has saved my bacon more times than I care to mention.

This is an array of 224 point lights (See *ARRAY LIGHTS* Above), each with an intensity of 0.5%. The light array was created by using the lightbulb geometry as a luxigon object to generate a light for every polygon. This simulates a real volume light source without the hideous radiosity render times. Looks pretty good, too. I could get rid of the lines by jittering the geometry or spinning the light array.

The simple fact is, if you understand light and shadow as they work in the real world, and know intimately the strengths and limitations of each of your LightWave lighting instruments, you'll be able to light any scene any time with any light instrument. I once made the challenge that I could light any environment to any quality level with nothing but point lights. Can you? ■



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NICHOLAS IS THE AUTHOR OF THE BEST SELLING LIGHTWAVE BOOK *LIGHTWAVE 3D 7.5 LIGHTING*, AND ITS NEW 2ND EDITION *LIGHTWAVE 8 LIGHTING*. HE HAS RECENTLY RECEIVED AN EMMY NOMINATION FOR OUTSTANDING SPECIAL VISUAL EFFECTS IN A SERIES FOR HIS WORK ON THE TELEVISION SERIES, *DEAD LIKE ME*.

TIPS & SECRETS: SPEEDING UP SASQUATCH RENDERS

HERE ARE A FEW TIPS THAT WILL HELP YOU KEEP CONTROL OF YOUR SASQUATCH RENDER TIMES:

1. USE SHADOW-MAPPED SPOTLIGHTS, AND ONLY SHADOW-MAPPED SPOTLIGHTS.
2. TURN FIBER DIVISIONS DOWN AS LOW AS POSSIBLE. IF YOUR HAIR, FUR, GRASS, OR WHATEVER IS SHORT, THEN IT WON'T NEED TO BEND MUCH. YOU CAN GET AWAY WITH A SETTING AROUND 5%.
3. A HIGHER COARSENESS WILL ALLOW YOU TO GET AWAY WITH LOWER DENSITY.
4. IN THE PIXEL FILTER, USE ONE PASS AA. YOU CAN ALMOST ALWAYS USE ONE PASS AA UNLESS YOU NEED MOTION BLUR, BECAUSE SASQUATCH'S AA IS COMPLETELY INDEPENDENT OF LIGHTWAVE'S.
5. MOST OF THE SETTINGS IN THE PIXEL FILTER "RENDER" AND "SHADOWING" TABS AFFECT RENDER SPEED IN SOME WAY. TRY TO KEEP THE SETTINGS AS LOW AS POSSIBLE.

UV TEXTURING AND SURFACING IN LIGHTWAVE & PHOTOSHOP (PART 4)



Gregory "T Rex" Glezakos
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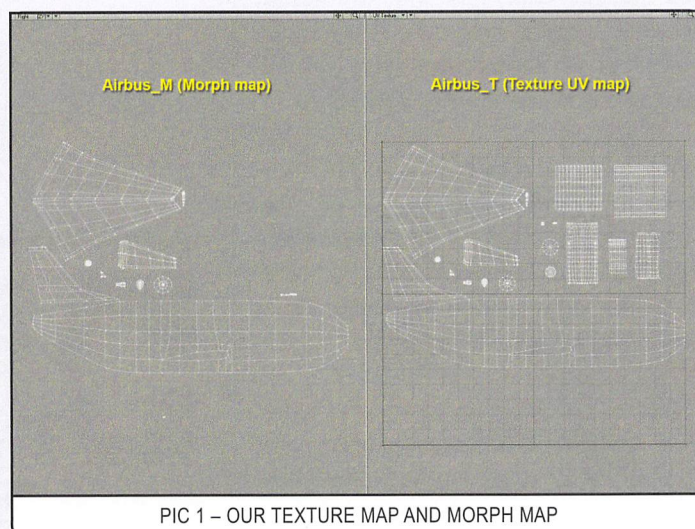
INTRODUCTION

Hello and welcome back to the series of tutorials about creating UVs in LightWave and painting textures in Photoshop for a civil jet airliner. This is the fourth and last part of the tutorials, so you need all three of the previous Keyframe issues in which Parts 1-3 appeared to catch up and complete the series. You also have to download the zip file that accompanies this tutorial from Keyframe magazine's Web site, which is the updated airplane object with the final UV and morph map and a necessary Layout scene.

This time we are going to learn how to use both the morph and UV map we've created to export a painting template from Layout and Modeler. Also, we're going to learn some Photoshop tips, in order to create better looking texture maps for realistic surfacing in LightWave.

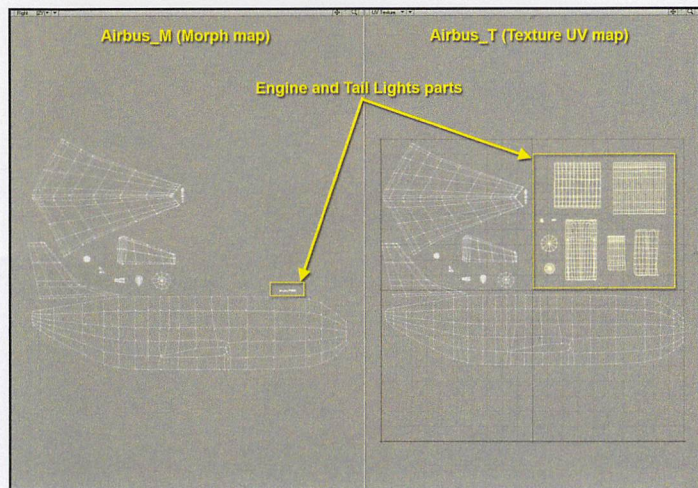
ANALYZING THE MAPS

Let's open Modeler and load up the aircraft object you've downloaded from the Keyframe site. We have two layers. The first layer is the part of the Airbus that needs to be mirrored when we finish texturing. The second layer has the parts that are already at their



PIC 1 – OUR TEXTURE MAP AND MORPH MAP

full state and don't need mirroring. We're going to merge both layers into one, but we have to keep this object with the two distinct layers, in order to mirror create the other side of the aircraft when we finish the textures. Cut layer 2 and paste it into layer 1. You can rename the layer 1 to "Airbus" if you like. Then save the object with a new file name, like "Airbus-Final."



PIC 2 – ENGINE AND TAIL LIGHTS NEED A TEXTURE TEMPLATE

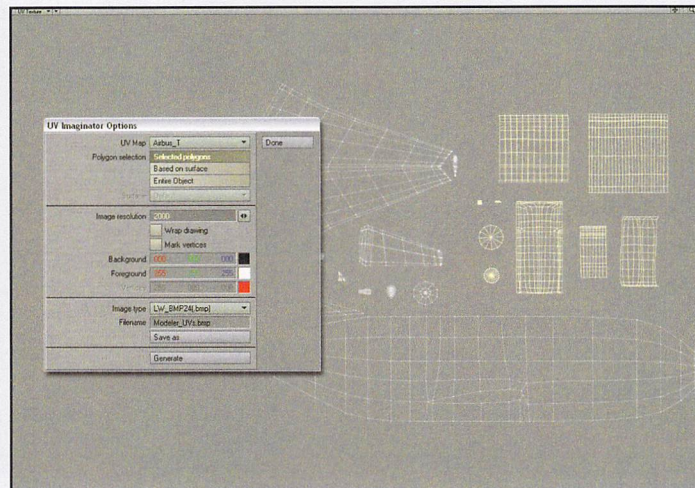
As you can see, we have a Texture UV map called “Airbus_T” and a morph map “Airbus_M.” We’ve also rearranged all the parts to more logical positions since our last tutorial. (PIC1)

These maps look similar, but are different. We’ll use both of them as painting references for our textures. For some of the aircraft parts, we’ll use a UV export directly from Modeler for a painting reference. For all the rest of the parts, we’ll “export” the morph map from Layout as a painting reference, and later we’ll use it again to counter-distort our final textures to eliminate subdivision surfacing distortion. Finally, we’ll combine the textures from both maps in Photoshop to have a single texture file for each surface texture channel.

EXPORTING FROM MODELER

From Modeler, we need a texture template from those parts that have no obvious texture distortion when we switch from polygons to subdivision surfaces. These parts are the Engine and the Tail Lights. (PIC2)

As you notice, these parts have a Texture UV map, but don’t have an obvious morph map. This is because we won’t use them in Layout for the counter-distortion technique. The parts that don’t need UV mapping, like the Antistatics or Pitots, also don’t have a valid morph map. Parts with valid morph maps are those we’ll actually use in Layout for the counter-distortion technique. For all the rest of the parts, we’ve shrunk their morph maps to a tiny size and positioned them somewhere they won’t obscure any other parts, as you can see from PIC2.

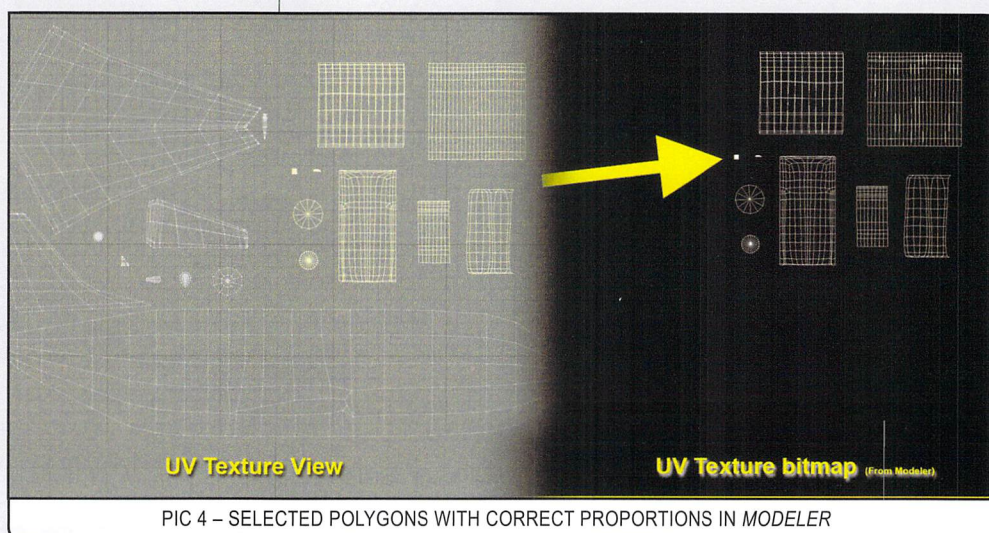


PIC 3 – THE OPTION PANEL IN UV IMAGINATOR

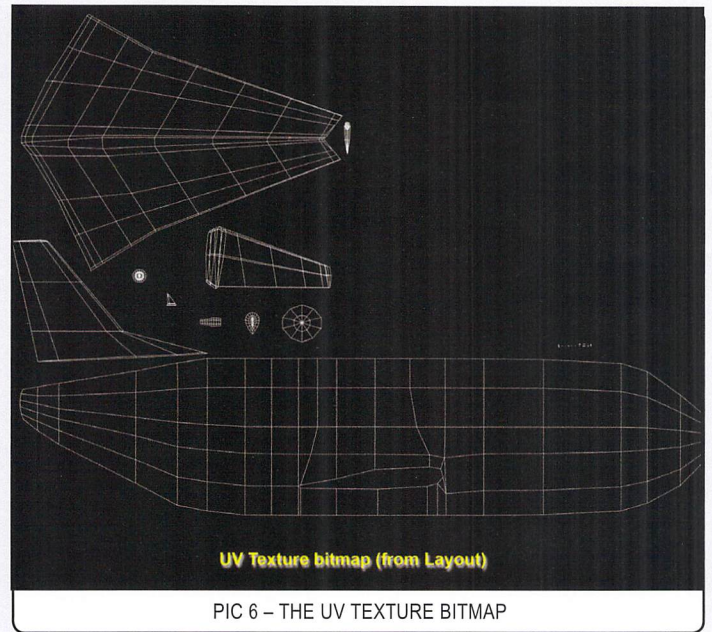
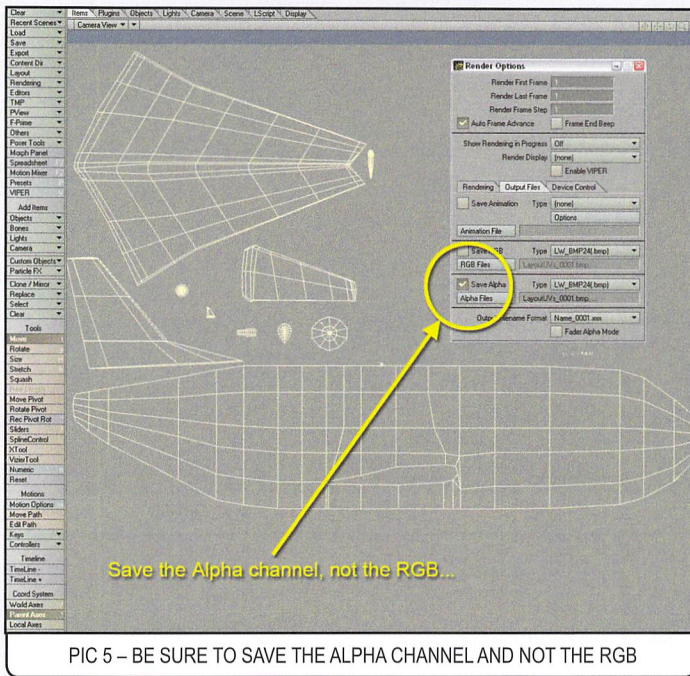
So, let’s export our first template from Modeler. We’ll use the free UV Imaginator tool from <http://www.3dcybercorp.com/software/uvimaginator/index.html>. In the UV Texture window, select all the Engine and Tail Lights polygons as shown in Pic3. Run the UV Imaginator to bring up its option panel (PIC3).

Polygon selection should be set to the selected polygons. For Image Resolution, enter 2000 pixels. Save in any format Photoshop can handle and use “Modeler_UVs” for a name. I prefer Windows Bitmap (bmp24), because it’s a standard Windows format and also uncompressed, but if you work on a Mac you can use any similar format you like. Click on Generate and you’re done. 2K size resolution for our textures is enough for medium to far shots of our airplane. Now, if you open the generated image, you’ll see only UVs from the selected polygons with correct proportions relative to the UV grid space. (PIC04)

That’s all we have to do in Modeler. We’ll export the rest of the airplane’s UVs from Layout, since we have to use the counter-distortion technique for those. Save the object with a new name like “Airbus_Final” before jumping to Layout.



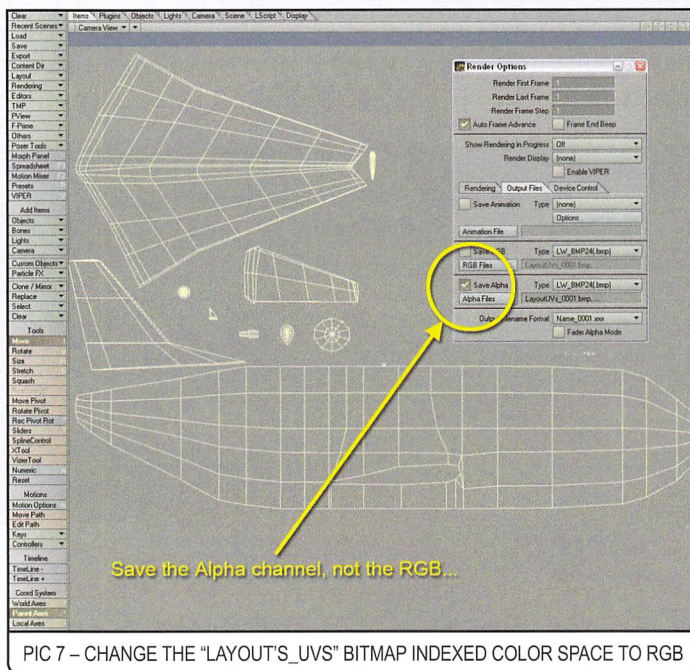
PIC 4 – SELECTED POLYGONS WITH CORRECT PROPORTIONS IN MODELER



EXPORTING FROM LAYOUT

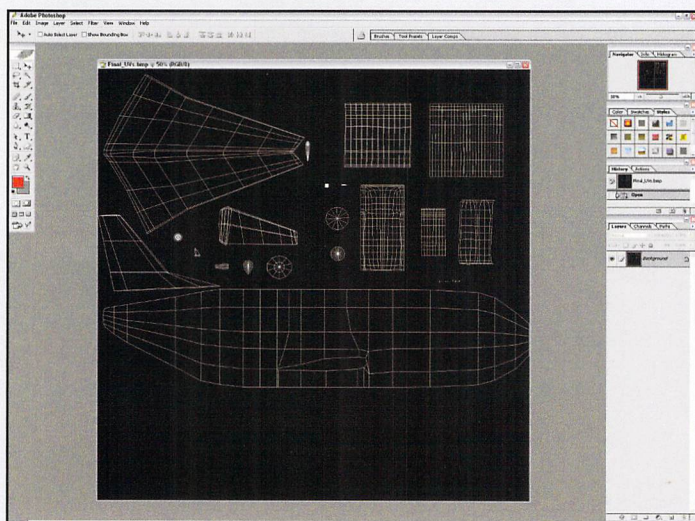
Go to Layout and load the provided scene from the zip file you've downloaded. When asked for the object, load the one you've just saved from Modeler. The first step is to use the morph map to export a texture template to use as guide in Photoshop to paint our textures. As you can see, everything is already set up for you. Here's a quick breakdown of the provided scene:

- The scene has the aircraft object we've just saved from Modeler, with the final UV and morph map, as was created through the past tutorials.



- This aircraft object has subdivision order set to "After bones," with Render Sub Patch level set to 0. This way, when we render, we get the cage object as quads like in Modeler, since no triangulation or subdivision is taking place. It also has the Morph Mixer tool applied with two keyframes. In frame 0, no morph is applied, and in 1, morph is at a 100% state.
- Camera is moved in extreme distance to eliminate perspective distortion, since LightWave can't render orthographic views. Lens Focal Length is set to 355 meters!
- Frame render resolution is set to 2000x2000. This is the size we want for our UV texture template map. Pixel aspect ratio is 1.
- Render mode is set to Wireframe, since all we need at first is a wireframe template, like the one we get when we export UVs from Modeler.
- Maximum antialiasing is used; it's a wireframe render only and will take seconds.
- If you have enough RAM you can set the Segment Memory Limit to 160 to get the render in one pass.

At the Render Options panel, save the rendered image using the name "Layout's_UVs," for the Save Alpha option, not the RGB saver. Use Windows BMP24 bit format or similar. Since this is a wireframe render, RGB and Alpha channels are almost the same, with the alpha's lines being solid white, whereas the RGB's affected from diffusion. Set Render First and Last Frame to 1 and hit F10 to render. (PIC5) We could do an F9 render at frame 1 and save manually, but this way the result is saved automatically for us. (PIC6)



PIC 8 – CHANGE THE BLENDING MODE TO SCREEN AND FLATTEN THE IMAGE

That's it. Now we have both the necessary templates to create the single one we'll use for the painting reference for our textures. Let's go to Photoshop and merge the two UV bitmaps.

FINALIZING THE UV TEMPLATE

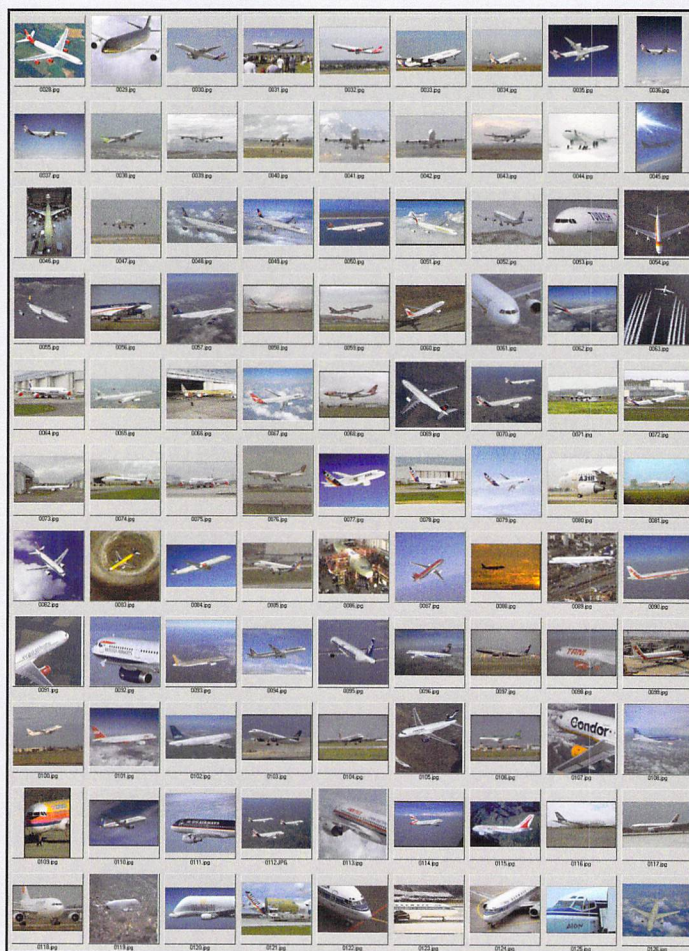
Open Photoshop and load the two UV bitmaps; the one exported from Modeler and the one from Layout. (PIC7) At the Edit drop down menu, change the "Layout's_UVs" bitmap INDEXED color space to RGB.

Then, use the Move tool and drag-n-drop the "Layout's_UVs" bitmap over the "Modeler's_UVs" bitmap. The image sizes are the same, so make sure you position the newly dragged layer to fit exactly in the window; grab it from a corner and move it until it snaps to the window's corner. Change the blending mode for that layer to Screen and flatten the image. (PIC08) Save it in BMP or a similar format and name it "Final_Uvs." Close the "Layout's_UVs" bitmap; we won't use it anymore.

TEXTURE PRE-PRODUCTION

We now have our UV template image to paint the airliner's textures. At this time, we have to start thinking — if we hadn't already — of the look we want for our airplane; the nationality coloring, if it's going to be a civil passenger or a cargo plane, how clean or dirty we want it to be, and stuff like that. In order to create textures as real as they can be, we are going to need references; a lot of photographic or video references. If possible, TONS of references! I'm sure many of you may have a great deal of links for aircraft photos over the Internet. Some of the best Internet sites I could recommend for thousands of aircraft photos and in huge resolution are:

1. www.airliners.net – Thousands of huge resolution photos here...
2. www.airbus.com – Also huge resolution photos here...
3. www.aircraftresourcecenter.com – Be amazed at the Walkarounds...
4. www.airwar.ru/indexe.html – Great database with photos and info...



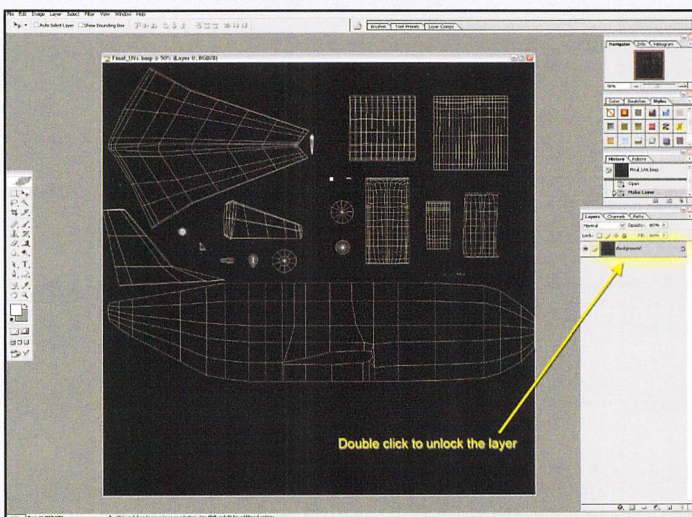
PIC 9 – AIRBUS REFERENCE PHOTOS DIRECTORY

Not only did I use the above sites for reference photos when painting textures for my aircraft, but also for when modeling. It took me a whole week to search, download, and categorize hundreds of photos about Boeing and Airbus aircrafts. In the end, I had four directories with:

- 153 Airbus aircraft photos
- 105 Boeing aircraft photos
- 190 close up on aircraft details photos
- 199 cloud photos (well... I also had to create clouds for that film shot)

Do not underestimate or take lightly the work to collect and organize references for your aircraft. I consider the time spent for this the most important of the whole project. There is no way one could model or create textures for a real aircraft without reference photos. Above are some thumbnails of my Airbus reference photos directory, just to get the idea and look of collecting and organizing photos. (PIC9)





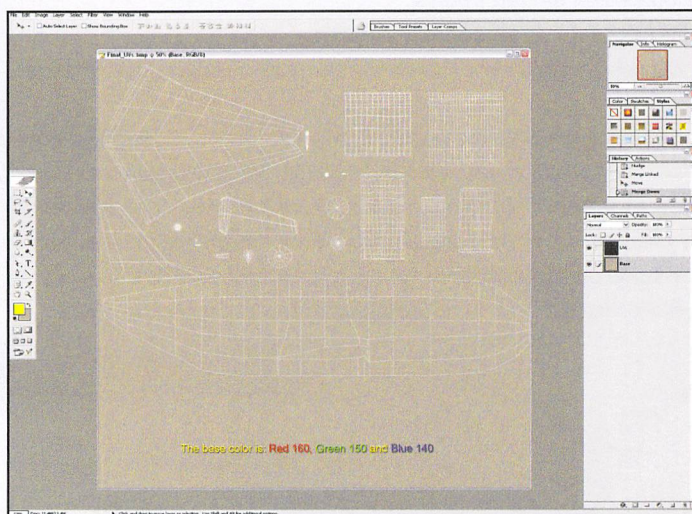
PIC 10 – UNLOCK THE BACKGROUND TO MAKE IT A COMMON LAYER

TEXTURE PRODUCTION IN PHOTOSHOP

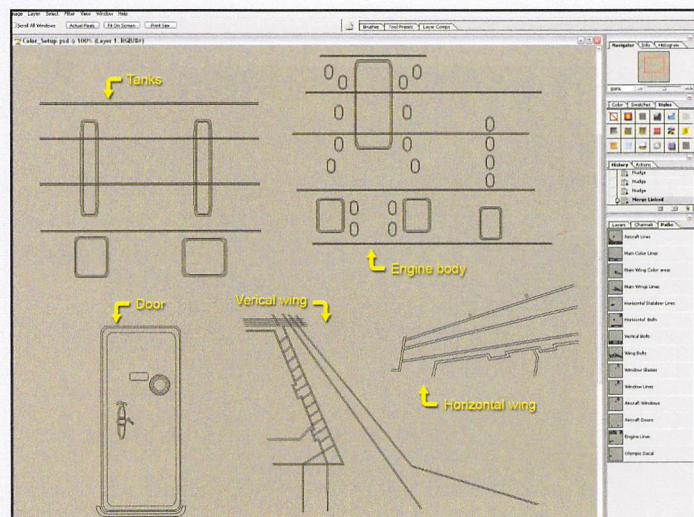
Assuming we've assembled our photo reference database, we're ready to start painting textures for our airplane in Photoshop. Since painting textures for this airplane in a step-by-step manner is beyond the scope of this tutorial and because many of you may want to paint your personal textures for your aircraft, we are only going to explore some techniques in Photoshop for creating aircraft textures. This way, you can use these tips for painting your own textures.

We'll start by painting the Color channel texture, since this is the most important channel for the aircraft's surface. In Photoshop, open the "Final_UVs.bmp" image with the UVs for our aircraft. Below is a common Photoshop layout you should use when painting textures. Double click on the "Background" layer to unlock it and convert it to a common layer. (PIC10)

Rename this layer to "UVs" and change its blending mode to Screen. Add a new layer, name it "Back," and fill it with the color Red



PIC 11 – THE UV'S LAYER SHOULD ALWAYS BE ABOVE THE LAYERS IN THE STACK



PIC 12 – BE FLEXIBLE SO YOU CAN GO BACK AND ADJUST THE PATHS EASILY

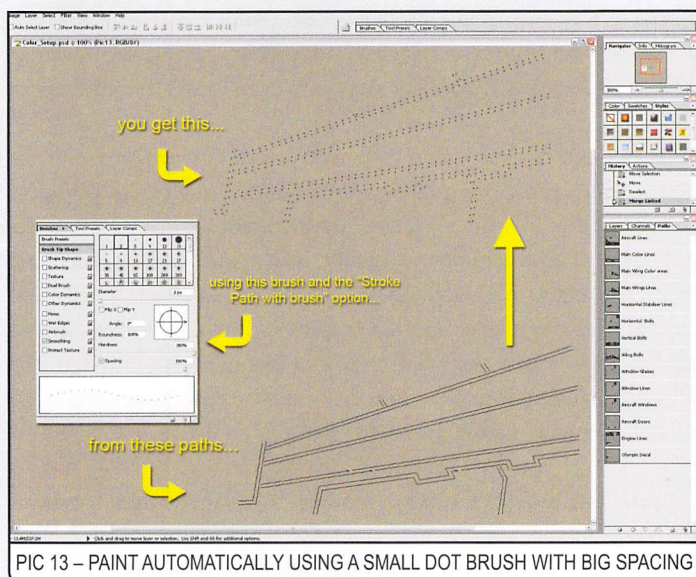
160, Green 150, Blue 140, or any color you prefer. This should be our back color; probably won't be seen on the final texture, but it's a good color to work with, and easy on the eyes. Drag the "Back" layer under the "UVs" layer. The "UVs" layer should always be above all layers in the stack. (PIC11) Now, it's a good time to save; use "Color_Setup" for a name and save as PSD, of course. Select the "Back" layer and create a new set. Name the set "Color" and drag the "Back" layer into it. Working with sets is always a good way to organize layers, because there can be lots of them.

• USING THE PATH TOOL

Our best bet working throughout the texturing process is using the Path tool to create all the details. With it, we can create all the horizontal and vertical lines that run across the aircraft body and details like windows, doors, decals and signs. Using paths, we can separate different color areas of the aircraft, create editable stripes, etc. This way, we can edit them precisely until we have the result we want. The key to the whole process is to remain as flexible as possible, to be able to go back and easily edit the paths to correct or alter the textures. (PIC12) Later on, we can use them for the bump, diffuse and other channels, as well. Using Path lines, we can create all the thumbs, bolts and screws that populate the aircraft and paint them automatically on the texture using a small dot brush with big spacing. (PIC13)

• BUILDING LAYERS

Use as many layers as possible when creating textures. Even for the tiniest edit, use a new fill or adjustment layer. This is the only way you can go back and re-edit a portion of a texture if the need arises. Also, this is a more flexible way to create the diffuse, bump or other channels when "removing" the color from the Color channel. A good thing to do in the beginning is use the Magic Wand tool to select all the outer black areas of the "UVs" layer, invert the selection, and then save that selection with a name like "Airbus."



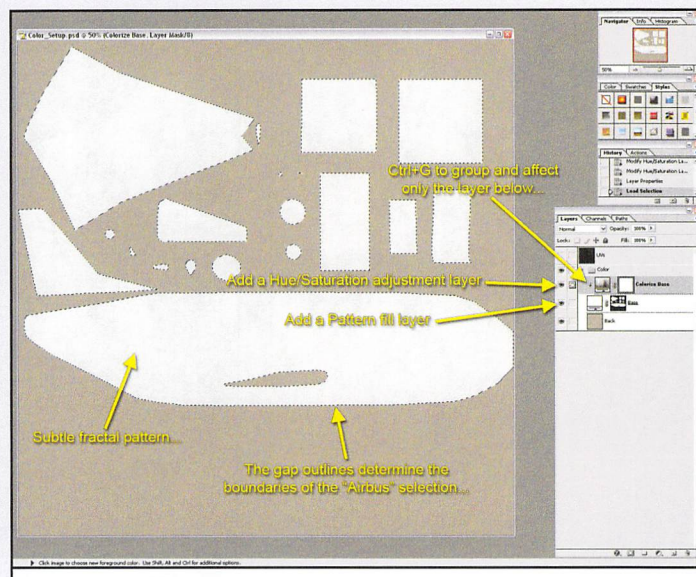
PIC 13 – PAINT AUTOMATICALLY USING A SMALL DOT BRUSH WITH BIG SPACING

This way, we have all the useful areas that need to be textured in a single selection. Everything outside that selection needs no texturing. Having the “Airbus” selection active, select the “Back” layer and add a new Pattern Fill layer on top of it. Use “Base” for a name and choose a pattern that’s almost like a single color. The idea is to use a subtle fractal pattern as a base color for the whole aircraft, instead of a single color. Don’t forget that fractals are everywhere! If you find a pattern that you like but don’t like the coloring, you can change its colors by using a new Hue/Saturation adjustment layer on top of it and then grouping it with the “Base” layer by pressing “Ctrl+G” (PIC14). This is the way to build every bit of adjustment or addition to the texturing process in layers. Finally, when you’re done with the Color channel, you’ll end up with lots of sets and layers, like in PIC15.

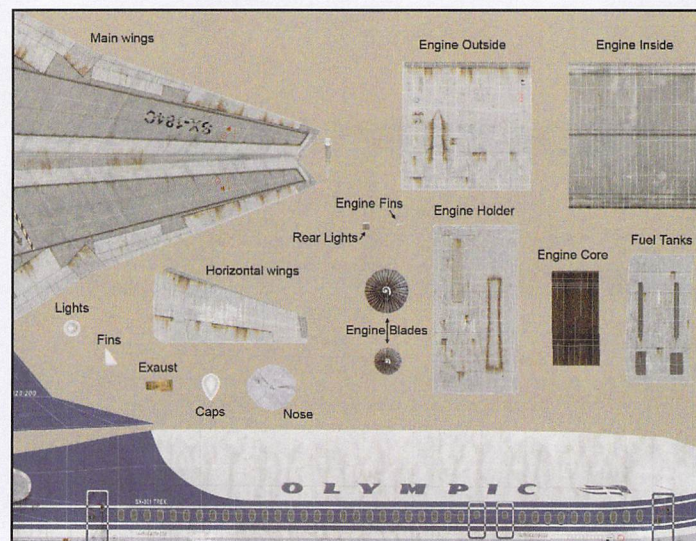
• GETTING DIRTY

In the real world, there’s no surface without some amount of dirt, dust, scratch, stain, or simple desaturation of colors. Aircrafts, unless they’ve just come out of the production factory, have been exposed to many weather situations during their life cycles. (PIC16) To create better looking textures, we have to mimic this weathering throughout our painting process. Studying real aircraft photos is the key to success here, though there are some general rules that apply when weathering maps for aircrafts. Since all the jet aircrafts fly forward when cruising, weathering on them tends to follow the direction of the air flow. We won’t find stains or rust on the main wings, which are perpendicular to the aircraft’s fuselage. So, keep the direction of the air flow in mind when applying weathering effects.

Don’t be afraid to get dirty with your textures. Unless you’re creating an ideal aircraft for the

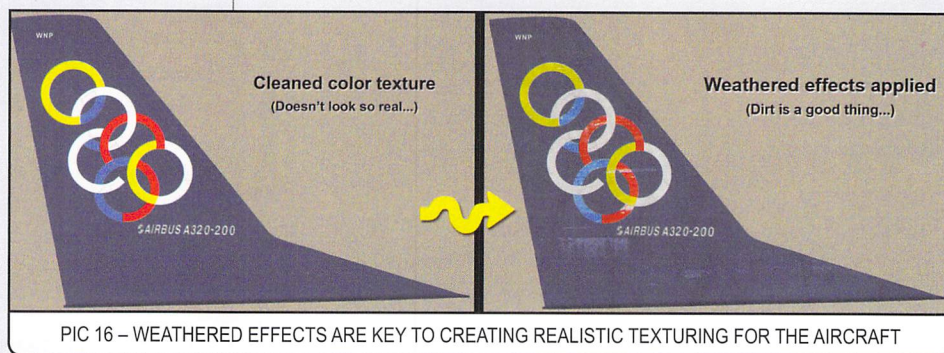


PIC 14 – YOU CAN ADD AN ADJUSTMENT LAYER TO CHANGE PATTERN COLOR

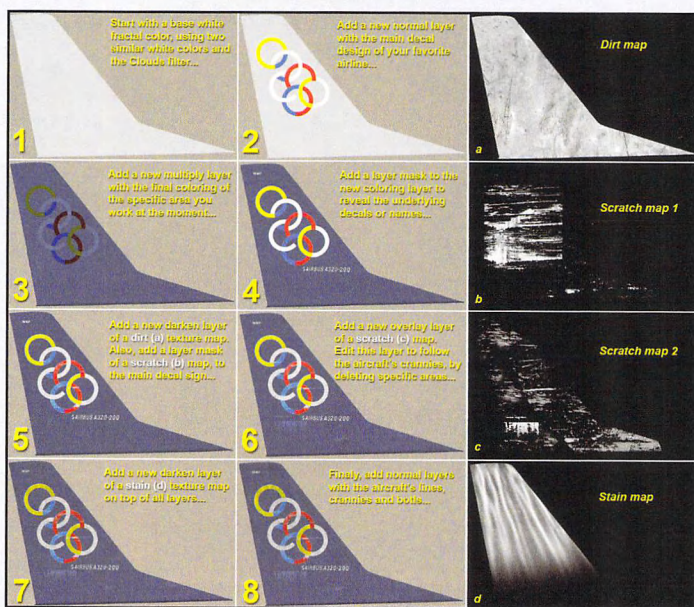


PIC 15 – YOU SHOULD HAVE MANY SETS AND LAYERS WHEN DONE COLORING

promotion of an airline, weathered maps should be your primary goal. Depending on the age, use, and service of the aircraft, you can make your textures with minor or major weathering effects. Even a simple desaturation of the main base color can make a huge difference on the



PIC 16 – WEATHERED EFFECTS ARE KEY TO CREATING REALISTIC TEXTURING FOR THE AIRCRAFT



PIC 17 – ADDING A LAYER MASK FOR SCRATCHES ON THE MAIN DECAL SIGN

final look of the aircraft. Most of your weathering maps should be grayscale, and you can use various blending modes, like Multiply, Darken or Overlay to apply them as layers or as masks for other layers.

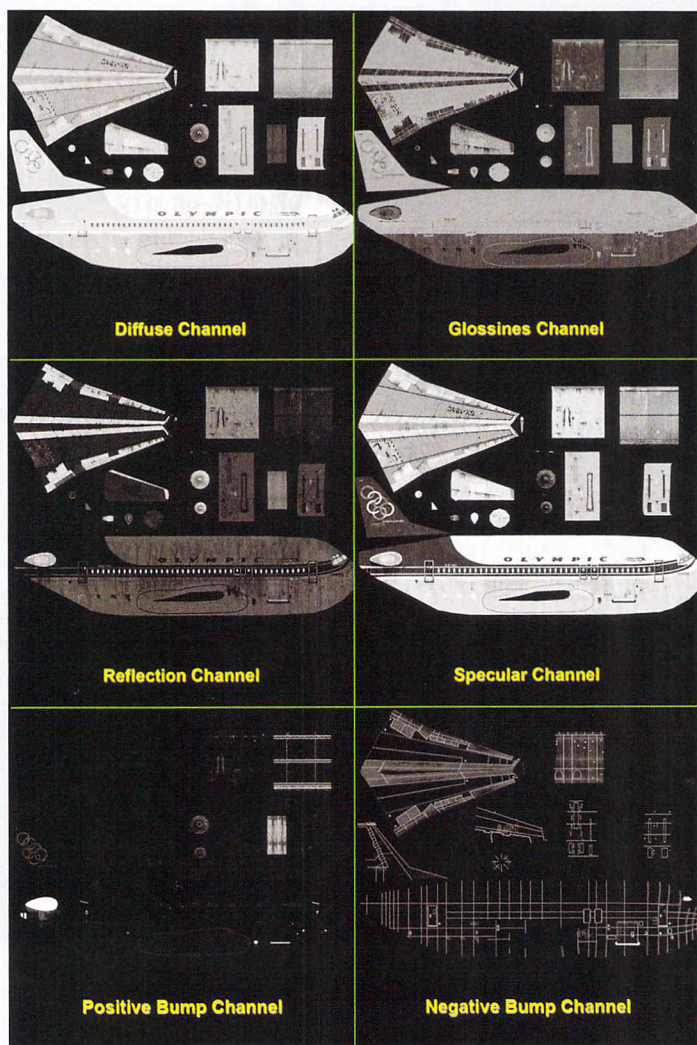
For dirt, you can use fractal maps with very small and fine details. For dust, you can apply desaturation effects to your base colors, using big and soft fractal images as masks. For scratches, you can use images with random vertical or horizontal hard lines in various sizes. The same maps, but heavily blurred, could be applied for stain effects. Finally, you can apply rust to specific areas of your maps, like around bolts, with a small orange brush color paint, then alter that using the smudge tool, to make the rust follow the direction of the air flow. Rust weathering effects, of course, should not be grayscale.

To the Left is a quick example of a step-by-step method for painting a weathered area of your aircraft's color texture. (PIC17) Your weathered maps can be fractal images that you've created manually or texture photos that you've converted in grayscale and edited their levels in Photoshop to accent the details. Remember to use as many layers as possible to add these effects in stacks. Some maps can be used as simple layers on top of other layers and some as layer masks for specific layers, like the scratch (b) map on the example, at left, which is being used as a layer mask for the main decal sign to add weathered scratches on it. (PIC17)

• GRAYSCALE SURFACE CHANNELS

When we finish the color texture map, we have to start creating textures for the other surface channels. We created the color map using numerous layers, multiple sets and editable paths. So, we can easily convert it to produce the rest of the channel maps. These maps should be for the Diffuse, Luminosity, Specularity, Glossiness, Reflection and Bump Channels. We won't see the interior of the aircraft, so there's no need for a transparency map. All these maps should be grayscale maps, since LightWave accepts color information only for the Color channel.

For Diffuse, Luminosity, Specularity, Reflection and Bump, the general rule that applies is that black area means less and white area means more. In particular, for Diffuse and Luminosity, black means no light is reflected in that area, whereas white means full light illumination. For the Specularity, black means no specular reflection occurs, whereas white means full specular reflection for that area. For the Reflection, black means no reflection occurs, where white turns that area into a perfect mirror. For the Bump channel, we're going to use two separate maps instead of one, because we need positive bumps that "go" outside the aircraft's surface and negative bumps that "go" inside, like bolts. The positive-negative bump direction is controlled with the Blending Mode or Bump Percent for each layer, in LightWave's Texture channel. Again, for Bump, black means no bump will occur, while white means full bump. The Glossiness map works in the exact opposite way than the other channels and always in cooperation with the specular map. So, if we had a full white color for the whole specular map of the aircraft, for Glossiness. Black means we'll get the biggest possible highlight, where with white, the smallest. At Left you can see some texture maps for the various surface channels of this aircraft. (PIC18)



PIC 18 – THE UV'S LAYER SHOULD ALWAYS BE ABOVE THE LAYERS IN THE STACK

FINALIZING THE TEXTURES

After we finish painting all the texture maps in Photoshop, we have two more steps to do before we actually use them for surfacing our airplane. The first step is to use the “Front-Projection UVs” technique to distort our textures to compensate for the subdivision object’s UV distortion. Go to Layout and load the scene we used to export the UV template from.

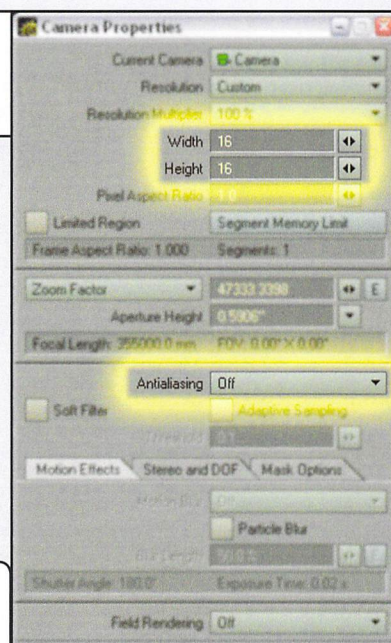
We’ll edit this scene to prepare it for the technique. In the Camera Properties panel, change the Width and Height to 16 pixels each and turn off the Antialiasing. (PIC19) We’ll rely on the Surface Baker plug-in for all our “rendering” needs, so we don’t also have to wait for a common Layout render. At the Render Options panel, set the Rendering mode to Realistic, the Multithreading to 1, Render First and Last Frame to 1, and disable any saving options. (PIC20)

Select the Airbus object, and at the Object Properties panel, change its Render SubPatch Level to 3. Open the Surface Editor, where you’ll see two surfaces; “Airbus” and “Metal Parts.” The second surface needs no texture map; plain vanilla surfacing will do fine for that surface. The “Airbus” surface is the one to which we apply all of our texture maps. Before we do that, we have to use the Surface Baker plug-in and the “Front-Projection UVs” technique. Click on the T button of the Color channel to open the Texture Editor panel. Change the Projection mode to Front, and for an image, load the Color texture map you created in Photoshop. Also, de-activate the Pixel Blending option. (PIC21) Click on Use Texture to close the Texture Editor panel.

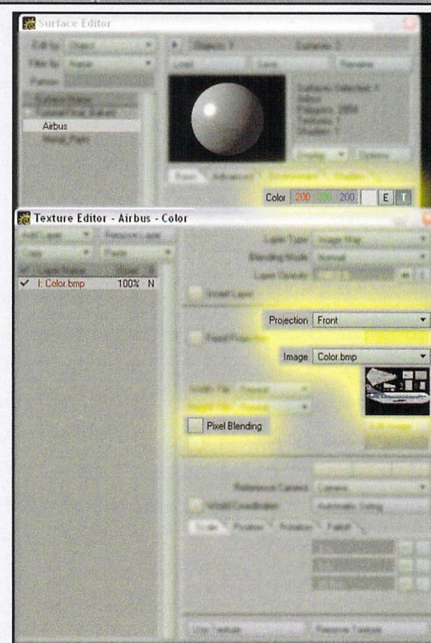
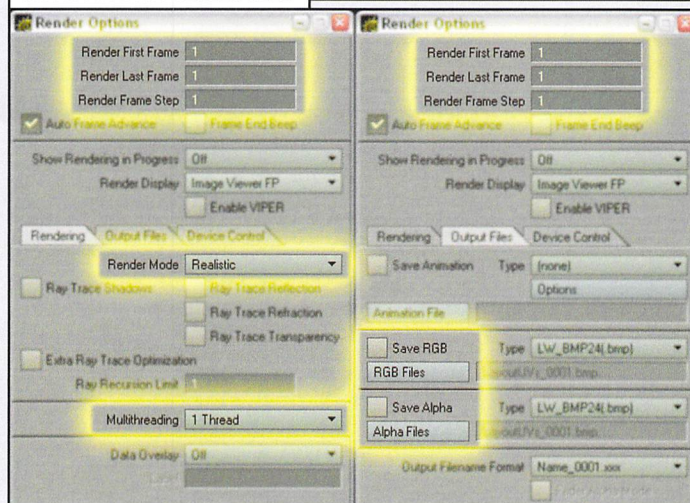
Click on the Shaders tab of the Surface Editor and add the Surface Baker plug-in. *Tip: If you stretch the Surface Editor’s window downwards long enough, the plug-in will load its settings inside the Surface Editor, instead of in a floating panel.* So, open the Surface Baker panel and set to Bake Color only. (PIC22) Set 2000 for the Image Resolution and use the one and only “Airbus_T” UV map. Click on Image Base Name to save the generated image on the disk in any format you like. As usual, I’ll choose LW_BMP24 and name the image “SB_Color.” Activate the Antialiasing and the View Image buttons. Save the scene with a new name; something like “Surface_Baker_Setup_Scene” will do fine. Also save the object. Go to frame 1 and hit F9 to render or hit F10 to render, based on the Render Options panel’s First-Last frame. After a few seconds, you’ll see the image with the color texture baked and slightly distorted onto the airplane’s UVs. You’ll notice that all the engine parts no longer have texture color. This is expected, since for those we didn’t want to use the “Front-Projection UVs” technique. Now, the last step before we finish the texturing process.

Go to Photoshop and load the original Color texture map you created and the SB_Color map that was generated from the Surface Baker plug-in. Drag the Color map on top of the SB_Color map

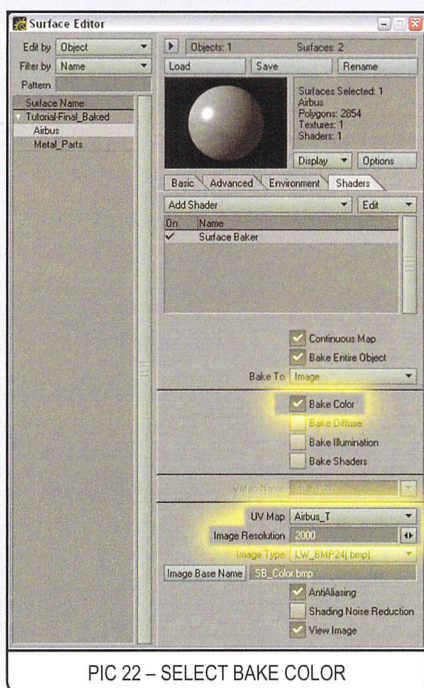
PIC 19 (AT RIGHT) – CHANGE THE WIDTH AND HEIGHT TO 16 PIXELS EACH AND TURN OFF THE ANTIALIASING



PIC 20 (BELOW) – IN THE RENDER OPTIONS PANEL MATCH YOUR SETTINGS TO THOSE SEEN HERE



PIC 21 – IN TEXTURE EDITOR, CHANGE SETTINGS TO MATCH THOSE SHOWN ABOVE



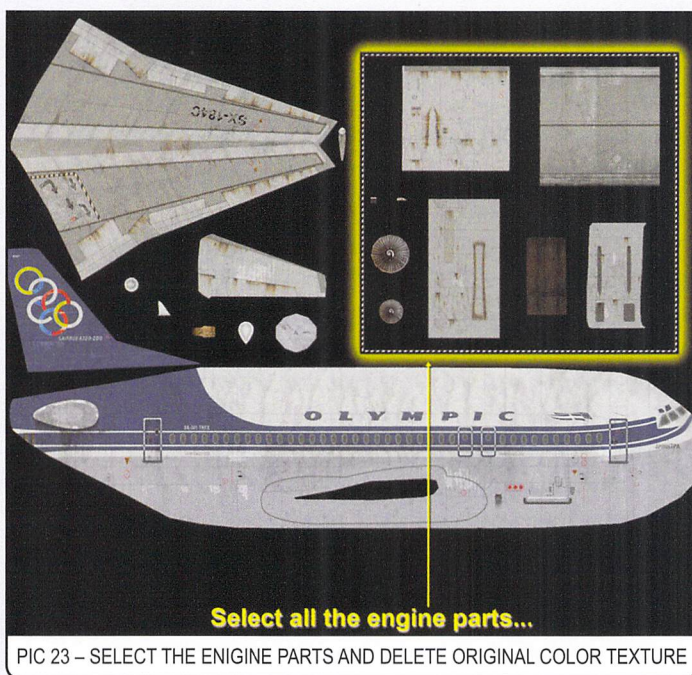
PIC 22 – SELECT BAKE COLOR

and make sure it's lined up perfectly on top. With a rectangular marquee, select all the engine parts, like in [PIC23](#). Then invert the selection and press Delete to clear all the original color texture minus the engine parts to reveal the distortion from the Surface Baker color texture underneath. Then flatten the image and save it as something like "Airbus-Color_Final." ([PIC24](#))

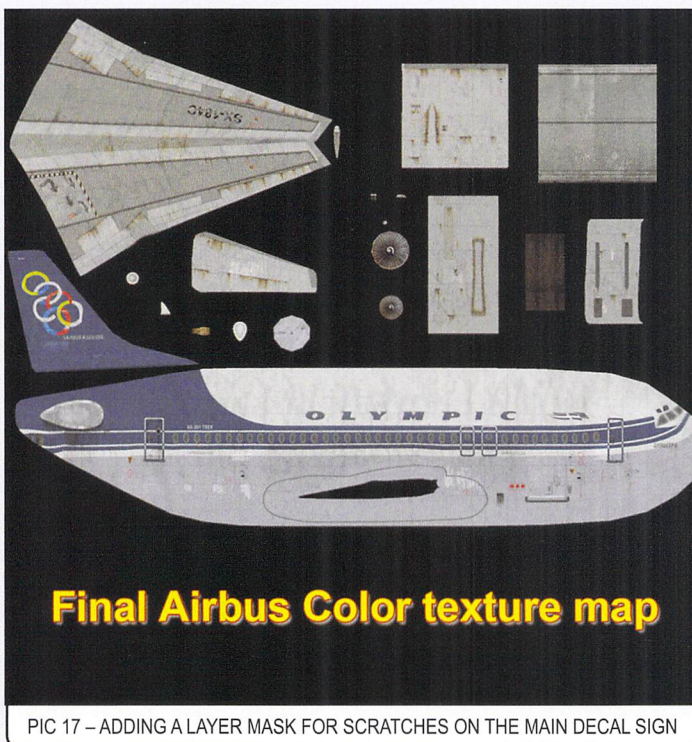
Well done! You've just finished all you had to do for your Color texture map for the airplane. Repeat the above process for all the rest texture maps you may have created; diffuse, bump, etc. You can do this easily by replacing the loaded texture each time in the Image Editor panel. Before you bake-render another texture, remember to go to the Surface Baker panel and save the generated image with a different name each time, or else you'll overwrite the same map with each bake-render. Then, load both the original and baked texture map of each channel in Photoshop and paste only the engine parts onto the baked maps to complete the process.

FINALIZING THE OBJECT

Now that the texture work is over, we can go into Modeler and mirror back the rest of the airplane. Load the original aircraft object you've downloaded from the Keyframe Web site. In layer 1, use the Mirror tool with default settings -- on X-axis, 0, 0, 0 for Center, Merge Points on -- to create the other side of the aircraft. Then cut layer 2 and paste it in layer 1. Now, you can delete the "Airbus_M" morph map, since we no longer need it. After deleting the morph map, hit m to merge all the points to make the Airbus a single smooth object. Save it with a new filename and go to Layout to start surfacing it with the textures you've created. If you like, you can give opposite sides different surface names and mirror all decals and names on your textures to properly display them on the opposite sides, as well.



PIC 23 – SELECT THE ENIGINE PARTS AND DELETE ORIGINAL COLOR TEXTURE



PIC 17 – ADDING A LAYER MASK FOR SCRATCHES ON THE MAIN DECAL SIGN



CONCLUSION

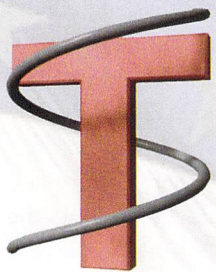
That's it! You've made it through this four-part tutorial series about creating UVs in LightWave and textures in Photoshop for a jet airliner. The sole purpose of this series was nothing more than to show you various ways and alternative routes for creating UV Textures in LightWave. Most of the time, you don't have to use all of the techniques described in these tutorials, but any one of them that you like the most. The tips for painting textures in Photoshop were of course just the tip of the iceberg. But, they can set you free to start painting your own textures, instead of driving you through a step-by-step walkthrough for painting a specific texture type that many would not find tasteful for their needs.

I hope you like this series and find it useful. A lot of time and effort went into the making of them, but it was really a joyride for me. A big thank you goes to my friend Dan Ablan for his support, both moral and mental. Without him and Keyframe magazine, this tutorial series would never have been possible

Thank you all for having the patience to go through this four-part tutorial series. As usual, if you have any questions, suggestions, or anything you'd like to discuss with me, you can e-mail me at: Gregory@Sub-Pixel.com. Until our next tutorial, keep on LightWaving... ■



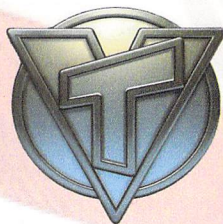
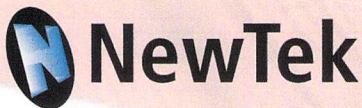
GREGORY GLEZAKOS (AKA "T.REX" TO HIS FRIENDS) IS AN EXPERIENCED 3D ARTIST WORKING PROFESSIONALLY FOR THE LAST 10 YEARS, EITHER AS A FREELANCER OR CONTRACTED TO MAJOR DOMESTIC PRODUCTION STUDIOS. WHEN BETWEEN JOBS, HE IS TEACHING LIGHTWAVE AND DIGITAL FUSION, EITHER TO STUDENTS OR BY HELPING ARTISTS IN VARIOUS VISUAL FX HOUSES MEET THEIR DEADLINES.



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TUTORIAL ON MIMIC:

• What you talkin' about, Willis?



Charlie Chaplin was “the man” during the silent age of films. He was able to convey pure emotion and tell the story of the film through the art of movement and facial expression. Back then, it was of optimum importance to be able to sell the tale with the calculated use of facial and body gestures.

The introduction of “talkies” brought about an evolution in filmmaking, bringing richness to the medium that was never before possible. There is a similar evolution taking place in the automation of character dialogue, as applied to 3D animation, and the software is getting better, faster, and more accurate every year.

The idea of manually lip synching characters to audio voiceover tracks has sent men, tough enough to tackle five or six guys in a bar room brawl, screaming for their mothers. It’s not fun, it’s tedious, and often inaccurate. So it is a good thing there are people out there tackling this most un-fun task, making it easier and more approachable.

Enter the Daz, as in Daz 3D. Their way cool lip synch plug-in, Mimic, gets your

models chatting the night away with a minimum of fuss. Let me show you just how fast you can get up and running. As with most things though, there is a wee bit of work to do on your part — you need to create and properly name the phonemes Mimic requires to work. Roll up those sleeves. We’re going in.

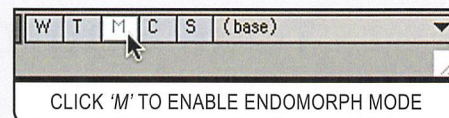
SETTING UP YOUR CHARACTER:

Before your character can speak his or her first line, it must be set up with the phoneme (mouth positions) endomorphs, required by Mimic, in Modeler. This is easily the most time consuming part of the process, but I was able to finish in less than 30 minutes. A little tip you might want to consider is to build one master character, create all of his morphs, and rig him up with skelegons. Then, instead of repeating the creation of

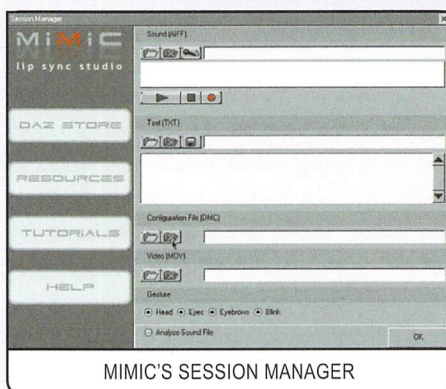
these morphs again, save the model out as another character with a different name. That way, you’ll do less work when building an entire cast of characters!

I used this technique to build the entire cast of models for the “Black Zero: Mercenary Ant” film. So, from this model, I saved as another character and simply changed the mesh by pulling, stretching, and changing surface names. The morphs are still associated to the mesh, as long as you don’t add or remove any polygons.

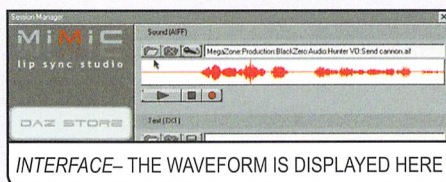
Start up Modeler and enable the Endomorph mode by clicking the *M* at the bottom right of the interface.



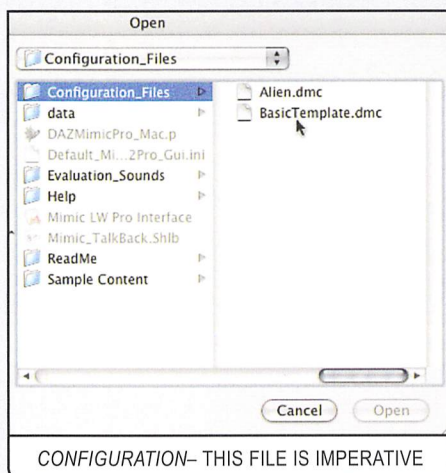
From here, add one new morph pose for each of the mouth and expression shapes listed here [\[Above Right\]](#) (in yellow). Be sure to follow the naming convention exactly as shown. Don’t worry if you’ve already created morphs previously, like I have on this character. Just add the new morphs, or rename the old ones to match those in the list. After that, you have to give your characters some facial expressions, conveying happiness, sadness, anger and so on.



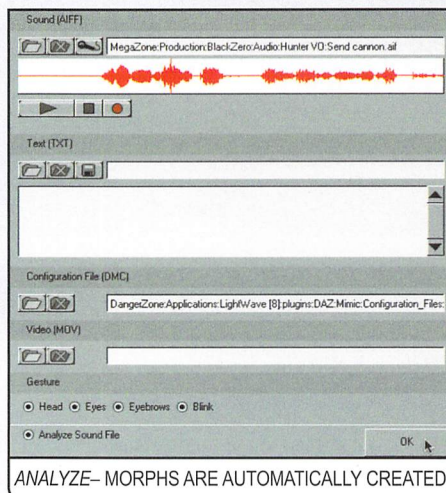
MIMIC'S SESSION MANAGER



INTERFACE- THE WAVEFORM IS DISPLAYED HERE



CONFIGURATION- THIS FILE IS IMPERATIVE



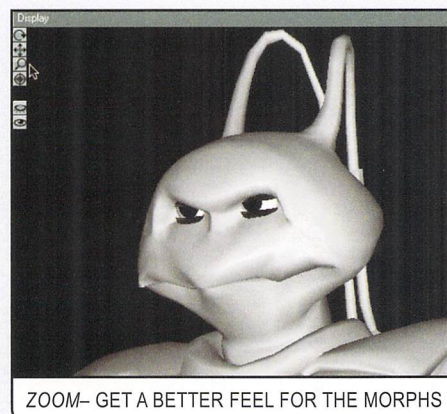
ANALYZE- MORPHS ARE AUTOMATICALLY CREATED

Click the image of the folder to locate the sound file you wish to use for your character. Windows users will be prompted for a .WAV file, while Macintosh users will be prompted for an .AIFF file. The audio's waveform is displayed in the interface. [\[See Interface at Left\]](#)

Now you need to load the "BasicTemplate.dmc" file to the Configuration File field of the Session Manager. Once you click the folder, the interface will find it automatically. This file contains the pre-configured preferences on how the audio will be analyzed and which phonemes, gestures, and expressions Mimic will apply to your character. In other words, without this file, your character will be as mute as one of those mimes everyone is so afraid of. [\[See Configuration at Left\]](#)

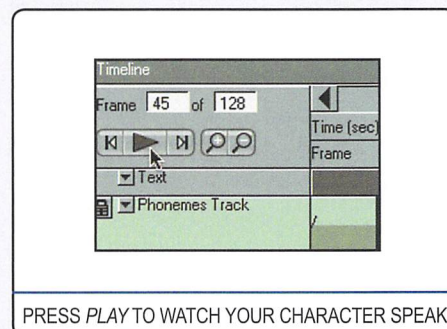
After everything is loaded, click OK and the Session Manager will automatically analyze the audio and create the morphs for your character. [\[See Analyze at Left\]](#)

At this point, to get a better feel for what the morphs look like, use the tools to zoom in to the face of your character. Then click the icon of the closed eye to hide the parts of the model that you don't need to see while working on phonemes — mainly the rest of its body. [\[See Zoom above Right\]](#)

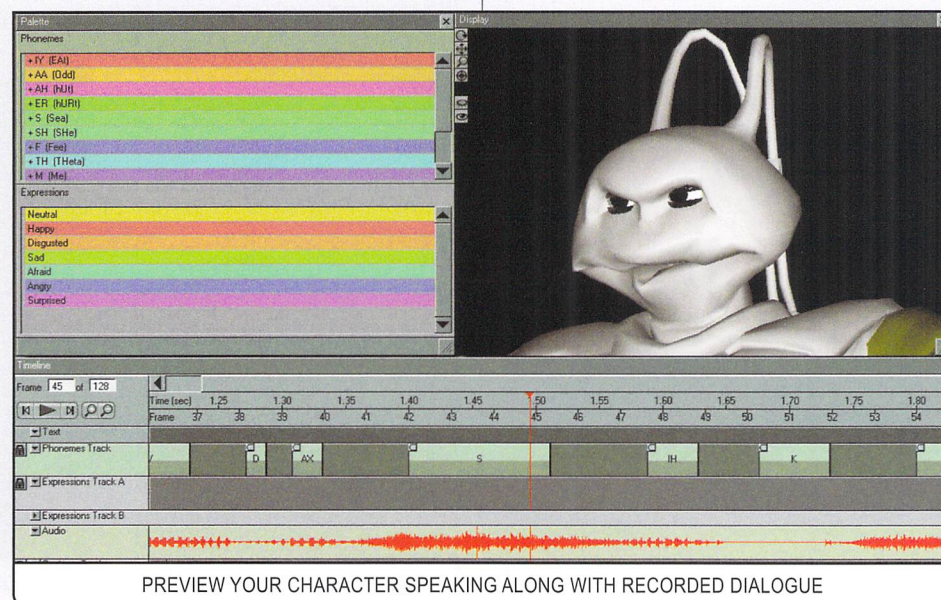


ZOOM- GET A BETTER FEEL FOR THE MORPHS

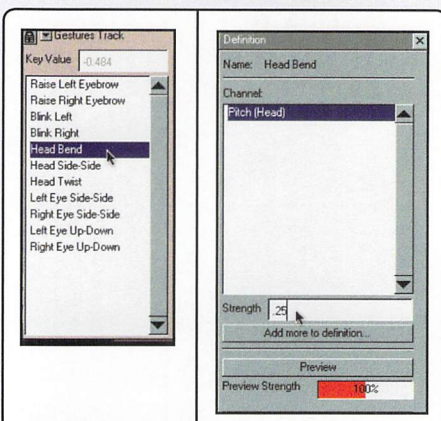
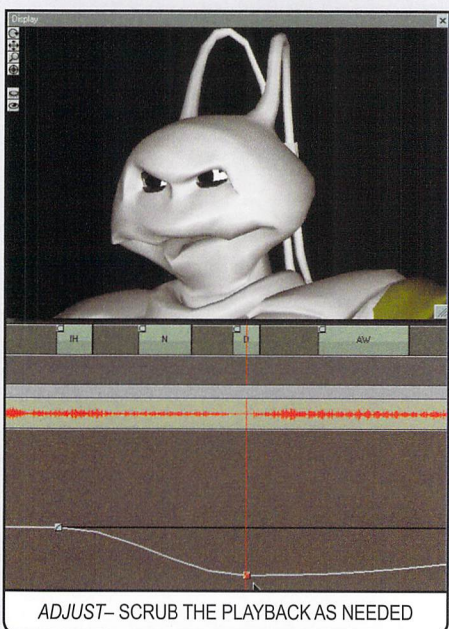
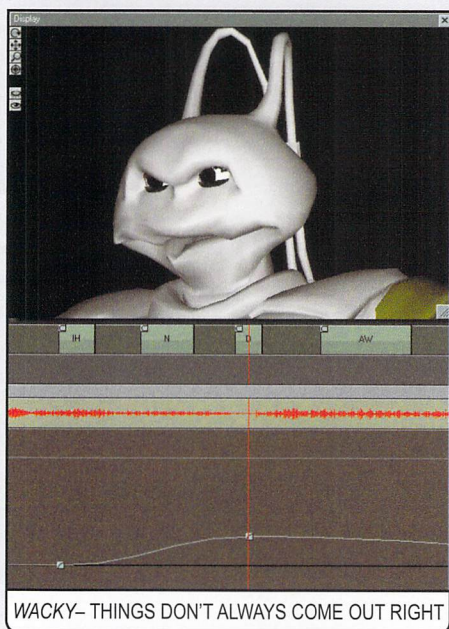
Now here comes the magic part: press the Play button in the Timeline to watch your character speak along with the audio. It's so cool, you'll need a cigarette afterwards. [\[Below and Bottom\]](#)



PRESS PLAY TO WATCH YOUR CHARACTER SPEAK



PREVIEW YOUR CHARACTER SPEAKING ALONG WITH RECORDED DIALOGUE



GESTURE TRACK (LEFT)- YOU CAN GLOBALLY AFFECT GESTURE STRENGTH
PITCH (RIGHT)- DROP THE PITCH BY LOWERING THE VALUE

CLEAN UP:

Of course, as with all things automated, everything doesn't always come out perfectly. In this picture, you see that Zero has gotten all wacky on me, because sometimes a morph is given too much emphasis. But this is very easy to modify.

[See Wacky at Left]

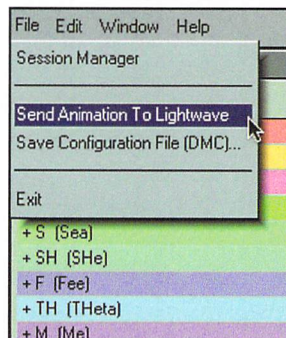
Mosey on down to the Gesture Track's timeline, which looks like the LightWave Graph Editor, and simply click and drag a key up or down to change its strength. You can manually scrub the playback head through the entire animation, adjusting keys as needed. *[See Adjust at Left]*

If you need to globally affect the strength of a gesture, simply double-click on its name in the Gesture Track's side panel. *[See Gesture Track at Left]*

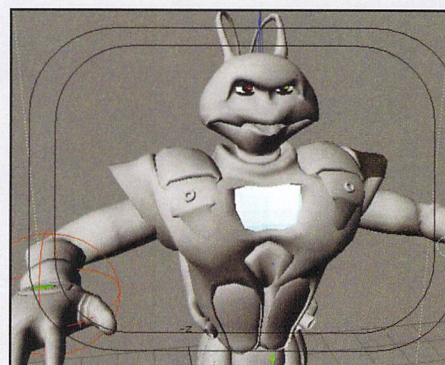
Now double-click on the name of the channel you want to adjust, in this case Pitch (Head), and drop the strength by entering a value lower than 1. *[See Pitch at Left]*

After you've gotten your character talking the talk and are ready to animate the rest of his body, you can choose File>Send Animation to LightWave. You may also choose to exit the Session Manager altogether. Both actions send the morph information to Layout, and when you press the Play button, or scrub the Timeline, you'll see the fruits of your labor. And, as mentioned a bit earlier, you can feel free to use the Morph Mixer to further tweak the character's performance.

It's great to know that our jobs as animators are becoming easier by the day, though there will always be the need for the human touch, as far as tweaking parts of a plug-in's work. We can spend more time focusing on making our characters drop-kick bad guys out windows, while letting Mimic do all the talking. ■



WHEN DONE, CLICK SEND ANIMATION TO LIGHTWAVE



ANIMATE THE REST OF THE BODY IN LIGHTWAVE



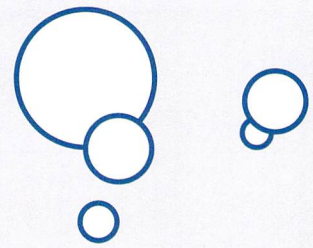
HUNTERWOLF (ALIAS "DWAYNE J. FERGUSON") IS A PRO ANIMATOR AND INSTRUCTOR OF LIGHTWAVE IN THE WEIRD LAND KNOWN AS NEW JERSEY. IN HIS SPARE TIME (WHAT'S THAT?) HE PLAYS XBOX LIVE AGAINST EDITOR-IN-CHIEF DAN ABLAN. YOU CAN FIND HIM UNDER THE GAMERTAG HUNTER WOLF. HE IS CURRENTLY IN PRODUCTION OF THE SHORT FILM *BLACK ZERO: MERCENARY ANT IN OPERATION SEA HAMMER*, WHICH HITS FESTIVALS THIS SUMMER. WWW.DIEHARDSTUDIO.COM

BY STEPHEN BURNS

A PHOTOSHOP TUTORIAL

UNDER THE SEA

I watched the waves violently splash against the monstrous rock formations. What motivation this served to write this article. However, instead of a coastline theme, why not use the idea for an underwater seascape fantasy scene?



A VOYAGE UNDER THE SEA

One of the most beautiful aspects of living on the West Coast is its coastline. As you travel north, it becomes even more beautiful by the mile. One of my favorite places to visit is the spectacular Carmel, California. Standing over the cliffs of Carmel and breathing in the ocean air, I watched the waves violently splash against the monstrous rock formations. What motivation this served to write this article. However, instead of a coastline theme, why not use the idea for an underwater seascape fantasy scene?

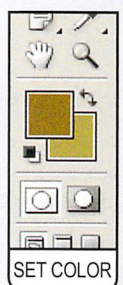
I thought I would challenge myself by creating the terrain for both the model and the surface mapping natively in Photoshop CS. Although this could be done with procedurals, I wanted to have complete control over the shape and texture of the landscape. Let's begin.

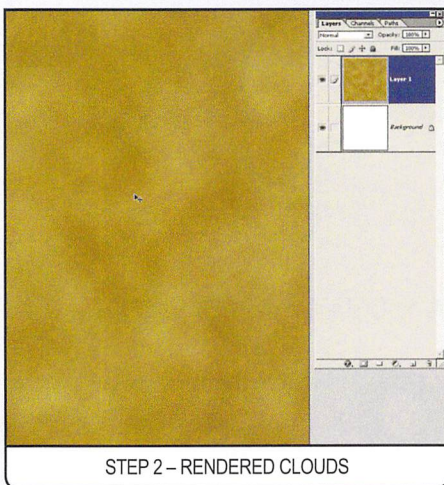
THE BASIC TERRAIN

Let's start by creating a new file. The topographical dimensions of the terrain will be square, so I chose a 5x5 Inch file with a resolution of 300ppi. Make sure that your Layers menu is open (*Windows>Layers*). Layers will be the vehicle by which you will create all of your surface mapping in Photoshop CS.

STEP 1

Next, we are going to set the foreground and background colors to reflect the basic pallet of our terrain. I chose a lighter and darker shade of brown in this example, but experiment with a variety of combinations.





STEP 2 – RENDERED CLOUDS

STEP 2

The intention is to work as if we are looking at our terrain from directly above. Why? Because with this information we are going to build our model using morph maps created from our Photoshop files. So let's give our image something that we can work with to build our terrain. Access *Filters>Render>Clouds*.

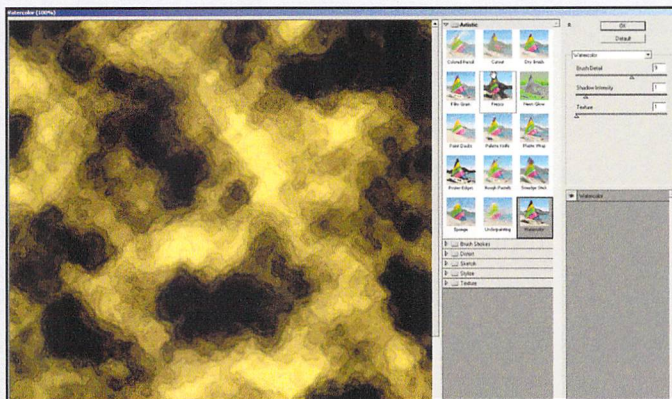
STEP 3

Now that we are in the beginning stages, let's define the peaks and valleys of our terrain. Access *Filters>Artistic>Watercolor*. In LightWave, we will eventually use our completed image maps to build a 3D object from the tonal information of our bitmap using our morph commands. The brighter tonalities will shape into our peaks and the darker tonalities will not move at all to become our valleys.

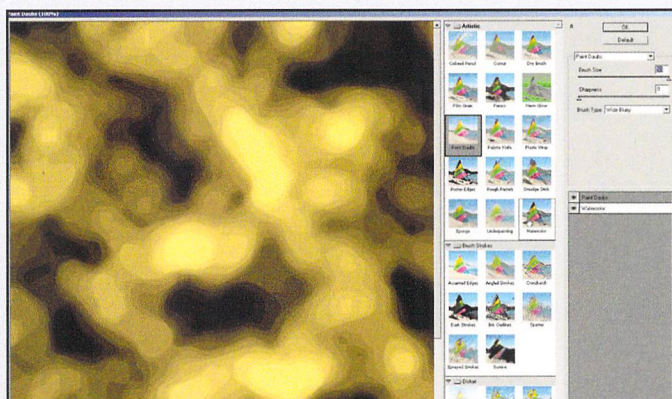
As you can see, the Watercolor filter not only begins to define potential shapes, but gives character to the edges of the shapes. Let's define it further.

STEP 4

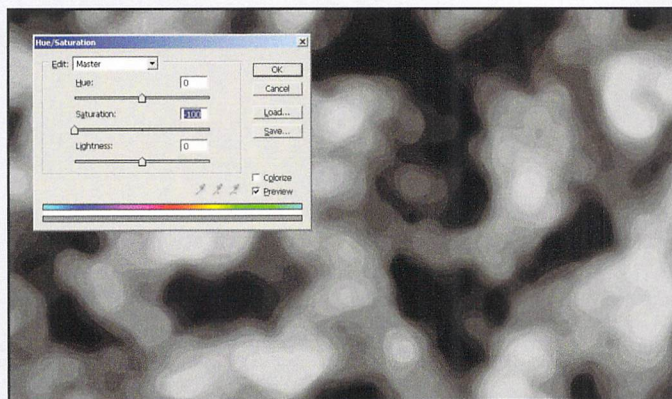
Access *Filters>Artistic>Paint Daubs*. This defines our terrain into something more visually identifiable, which makes it easier on the artist to make decisions on the look and feel of the final shapes. This will serve as our basic terrain.



STEP 3 – WATERCOLOR FILTER APPLIED DEFINES POTENTIAL SHAPES AND GIVES CHARACTER TO EDGES



STEP 4 – PAINT DAUBS FILTER DEFINES THE TERRAIN INTO SOMETHING MORE VISUALLY IDENTIFIABLE

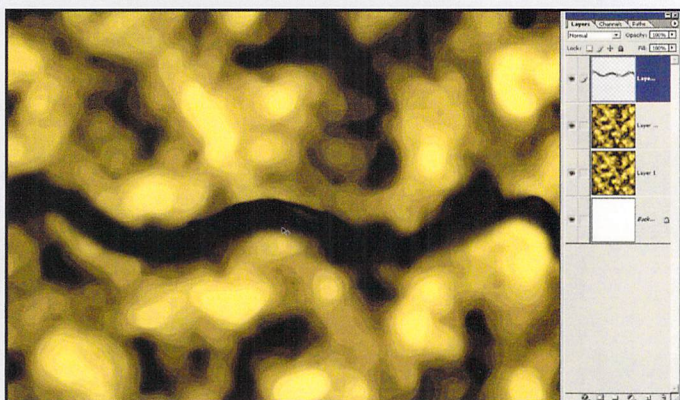


STEP 5 – ADJUSTING THE HUE & SATURATION SLIDER ALL THE WAY TO THE LEFT GIVES INSTANT GRAYSCALE

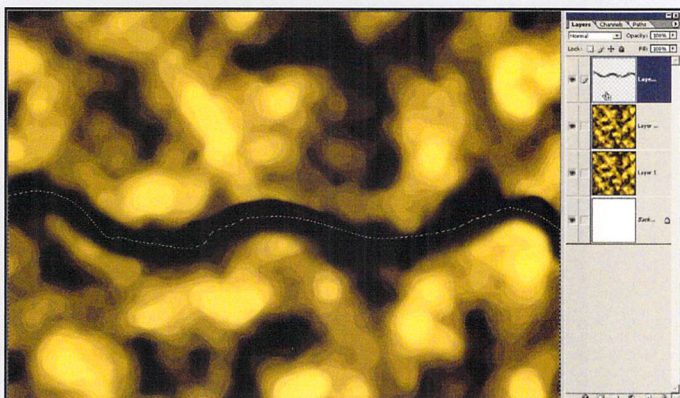
STEP 5

Now we are going to create the grayscale needed for our morph maps. Make sure that you duplicate your terrain layer (*Ctl J*), then access the Hue & Saturation dialogue (*Image>Adjust>Hue & Saturation*) and take your saturation slider all the

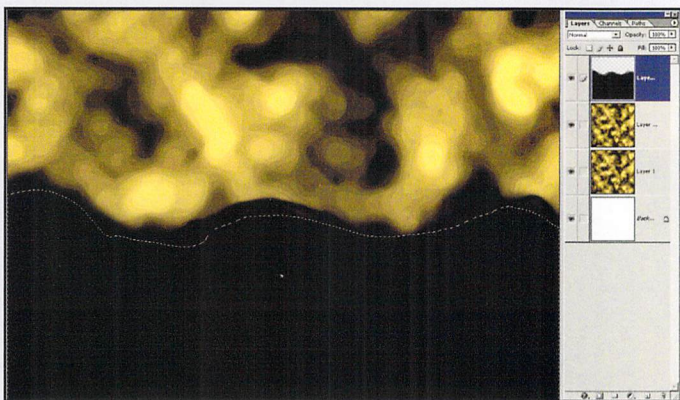
way to the left. There we have it ... instant grayscale. Save this image by accessing *File>Save For Web*. That will take you into Image Ready so that you can save your file at any level of compression format for gif or jpeg. Save it as a JPG format at 100% if you like and call it "Basic Terrain Morph" to keep organized.



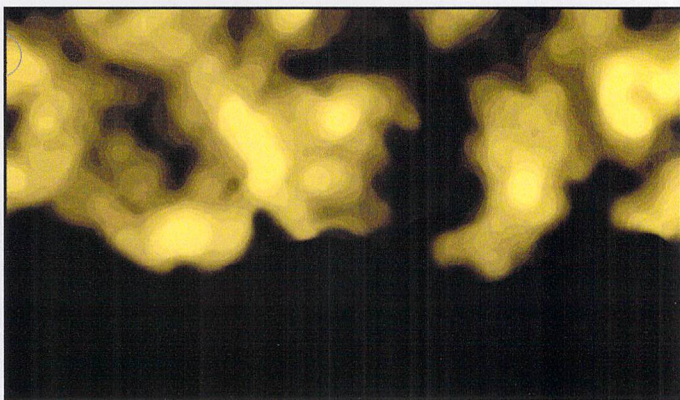
CLIFF EDGE 1 – PAINT A THICK BLACK LINE TO DEFINE THE CLIFF EDGE



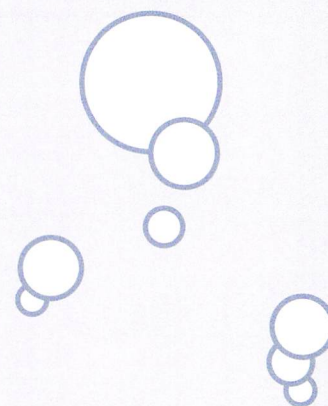
CLIFF EDGE 2 – USE THE LASSO TO SELECT FROM CENTER OF LINE DOWN



CLIFF EDGE 3 – FILL THE SELECTION WITH BLACK TO ACT AS CLIFF MASK



BE AS DETAILED AS YOU WANT IN CREATING CANYONS AND CLIFFS



STEP 6

Click the dark eye symbol to the left of the B&W texture layer that we just created to turn off its visual aspects. Make sure that the color terrain texture layer is selected. Duplicate this layer. In addition, create a new transparent layer above the duplicate. We will work in this one to create our mask for the landscape cliffs.

DEFINING THE CLIFFS

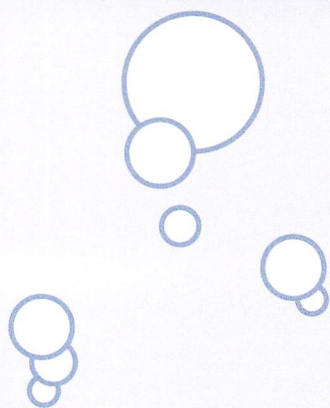
My goal is to create some cliff formations separate from the basic terrain. We will create a separate layer for that. Let's continue on.

STEP 1

Create a new layer and set the foreground color to black. Work in the transparent layer and use a fairly thick paintbrush to define the edges of the cliff as shown in image [\[Cliff Edge 1\]](#). Next, use the Lasso selection tool, starting inside of the black border and selecting everything opposite of our defined cliff's edge as shown in image [\[Cliff Edge 2\]](#). Now fill your section with black (*Edit>Fill>Black*). This will be our cliff mask to define its contour. Let's duplicate (*Ctl J*) this layer and use it later on in the tutorial.

STEP 2

I decided to add a little more detail and paint in a little canyon. You can be as detailed as you like. Now duplicate this layer so that we have an extra to use later in the tutorial.



STEP 3

Let's go to the color layer beneath our cliff mask and alter it to be used as a morph map. Let's start by flattening out the tonality to allow the highlight to dominate the image. I used a combination of Levels and Curves to achieve this. I started with Levels and pulled the midtone slider far to the left to allow the whites to dominate. However, the lower tones were still too dark. I handled them with Curves and placed the tonal adjustment point in the lower left corner higher to alter the blacks to become brighter grays that I place the point on.

STEP 4

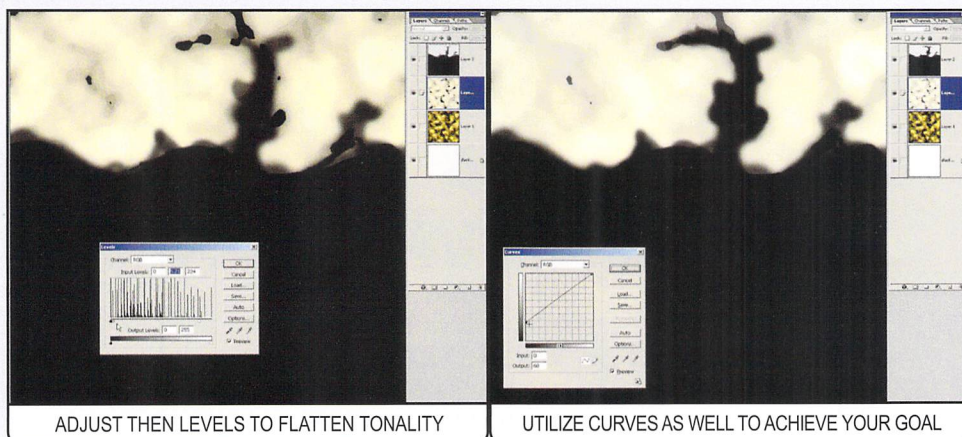
The intention is to make this cliff rise as one solid peak with some subtle surface texture, so most of the image must be white. By using Gaussian Blur (*Filters>Blur>Gaussian Blur*), you can soften the definition to gain more subtle tonalities.

STEP 5

Merge the cliff mask and the color layer together. Finally, access the Hue & Saturation (*Image>Adjust>Hue & Saturation*) and take the Saturation sliders all the way to the left to create our B&W image.

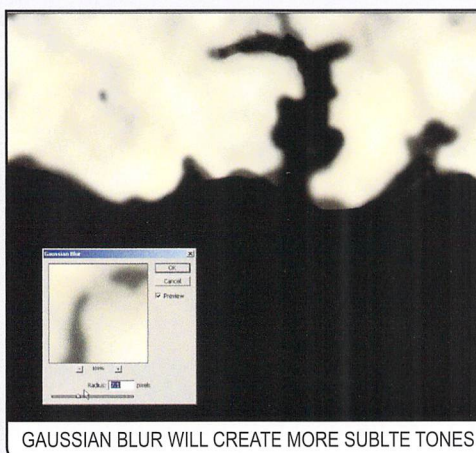
STEP 6

I chose to make one more variation by blurring a duplicate copy of the basic terrain morph and grating it to black.

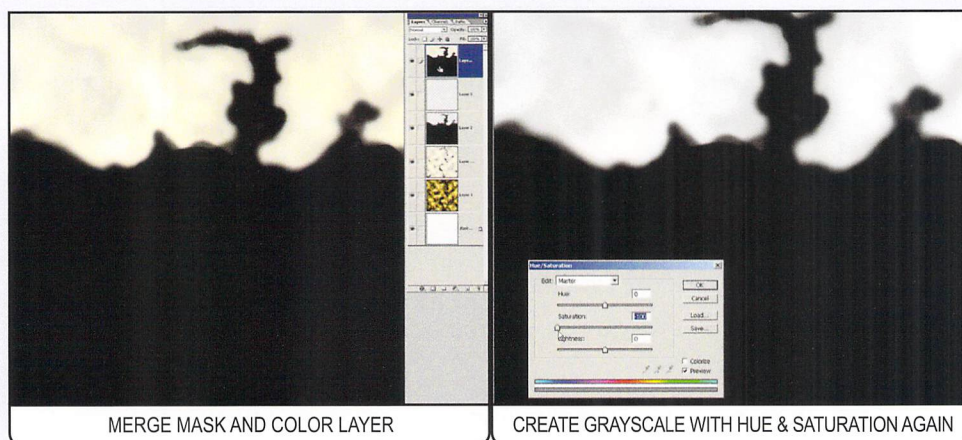


ADJUST THEN LEVELS TO FLATTEN TONALITY

UTILIZE CURVES AS WELL TO ACHIEVE YOUR GOAL

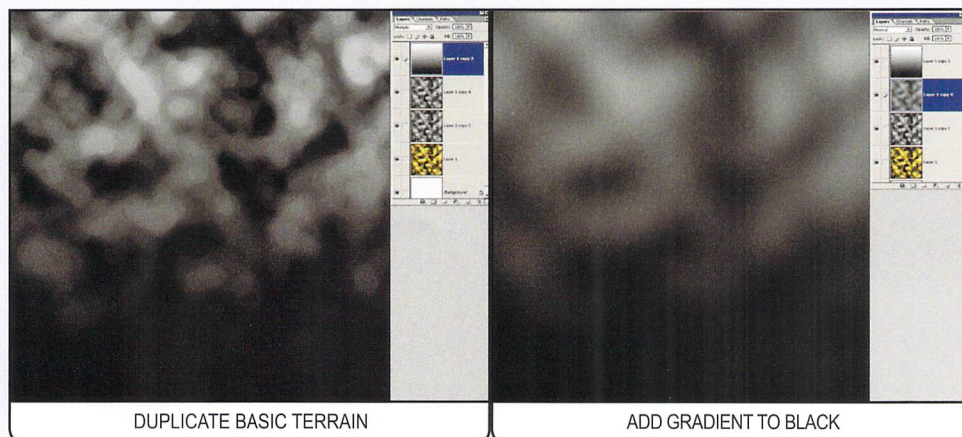


GAUSSIAN BLUR WILL CREATE MORE SUBLTE TONES



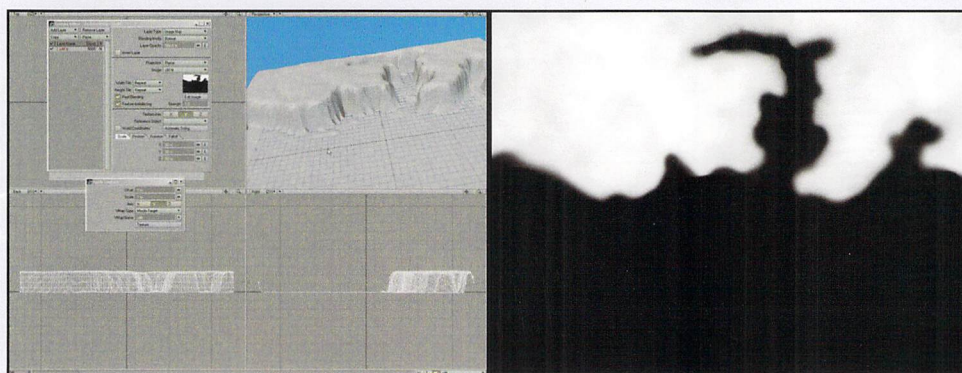
MERGE MASK AND COLOR LAYER

CREATE GRAYSCALE WITH HUE & SATURATION AGAIN



DUPLICATE BASIC TERRAIN

ADD GRADIENT TO BLACK



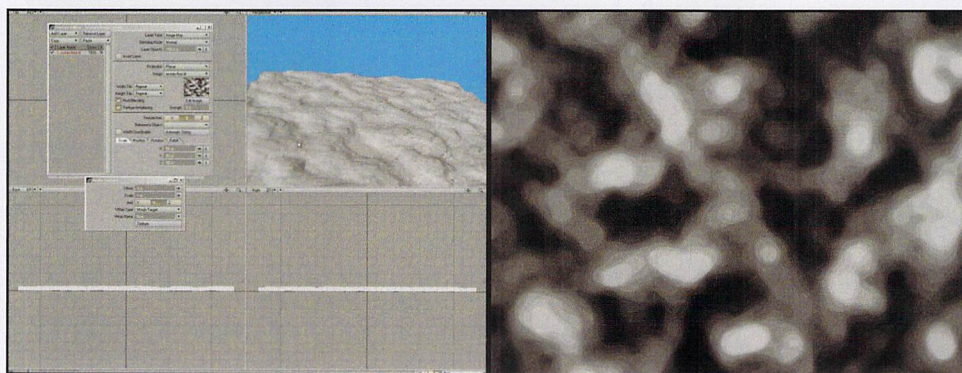
CLIFF MORPH MAP AND ORIGINAL PHOTOSHOP IMAGE



APPLYING THE MORPH MAPS:

STEP 1

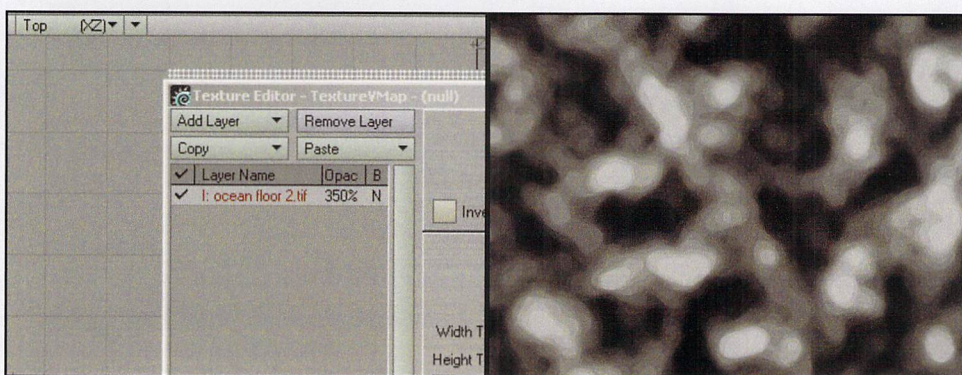
Since my image maps are square, let's keep it simple and make a square plane in Modeler. Apply each morph map to the square plane in LightWave. At the Left is an example of what the results will be as each one is applied individually to our plane:



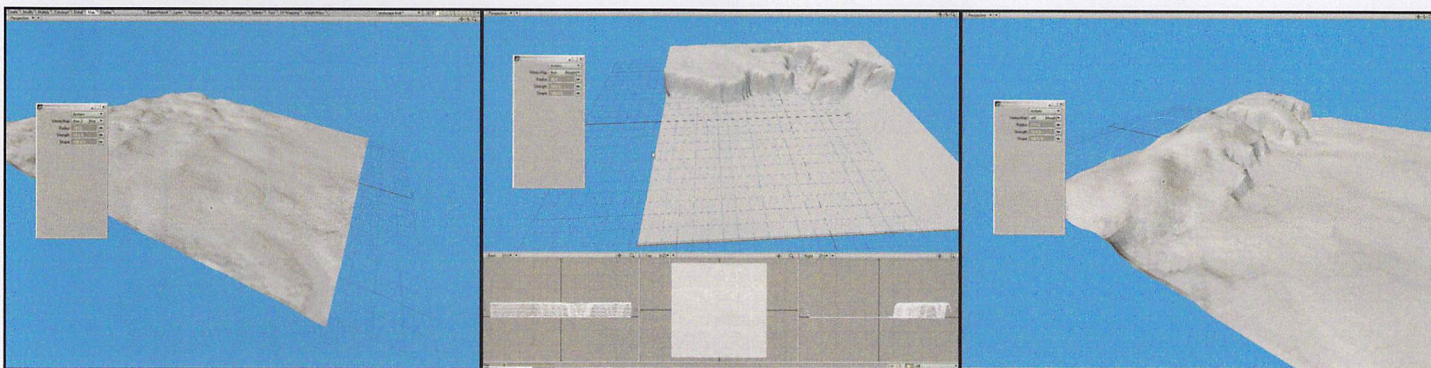
BASIC TERRAIN MORPH MAP AND ORIGINAL PHOTOSHOP IMAGE

STEP 2

To apply each morph, I used the Airbrush Tool (*map>Airbrush*). By selecting a morph map's name from a drop menu, you can paint in any variation of morph that you created. This allowed me to work more like a painter. I like to start off with a morph map that has the least elevation and work my way to the one with the most. This will give me all types of possibilities for my final project.



BASIC TERRAIN VARIATION MORPH MAP AND ORIGINAL PHOTOSHOP IMAGE



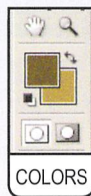
WORKING FROM MORPH MAPS WITH THE LEAST ELEVATION TO THE MOST GIVES ALL TYPES OF POSSIBILITIES FOR THE FINAL PROJECT

CREATING COLOR TEXTURE FOR THE TERRAIN

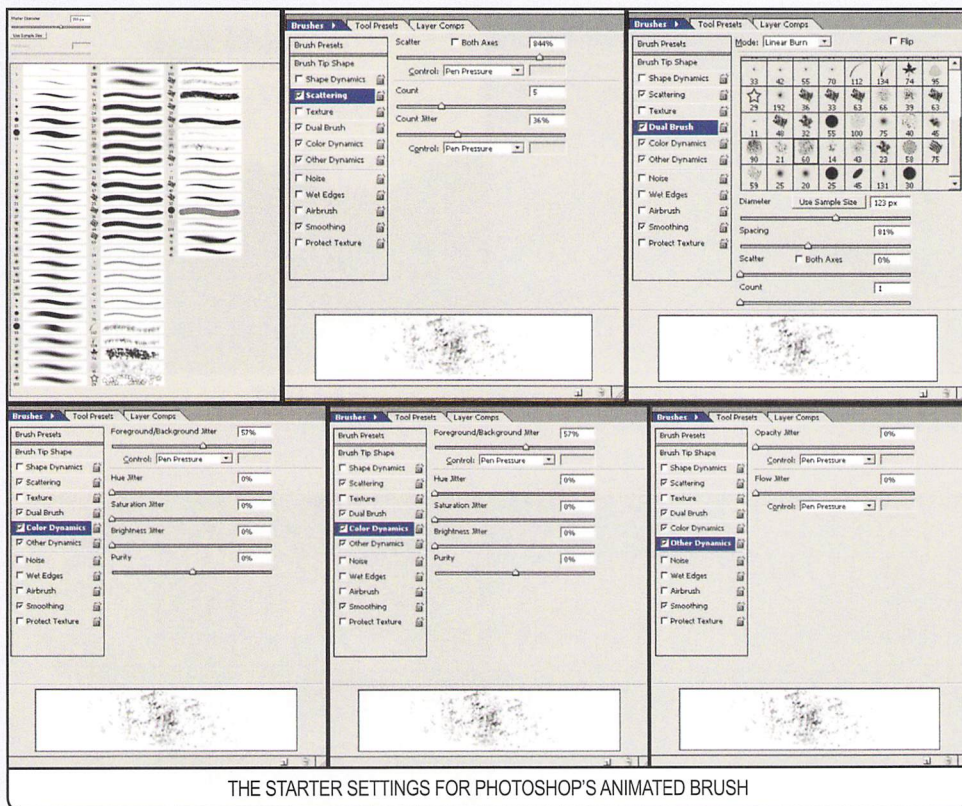
There are all types of ways of creating effects that can resemble landscape terrains. One of my favorites is to use the animated brush capabilities of Photoshop. At right is the setting I used as a starter.

STEP 1

Set your foreground and background color to a hue of your choice. I chose a shade of brown.



Paint onto a new layer until it is filled. Change your blending modes to Multiply and Lighten to vary the texture and tonality, as well as vary the size of your mouse (*Ctrl + or Ctrl -*).



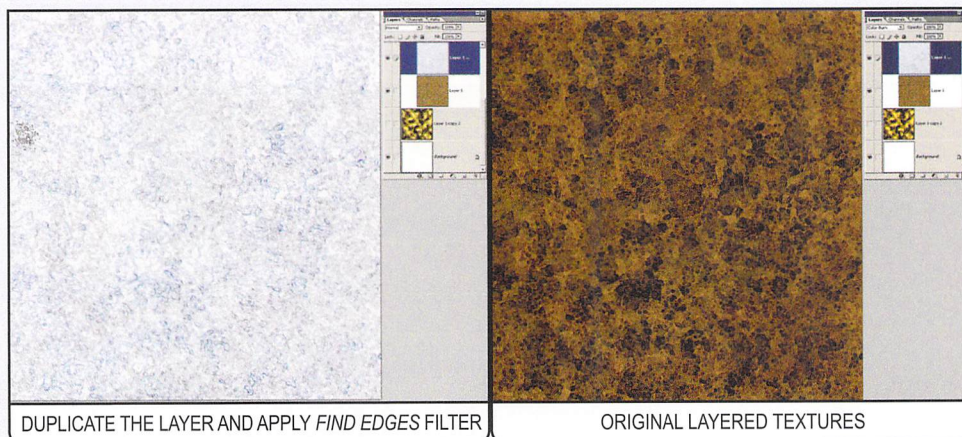
THE STARTER SETTINGS FOR PHOTOSHOP'S ANIMATED BRUSH

STEP 2

Duplicate the layer (*Ctrl J*) and apply the Find Edges filter (*Filter>Stylize>Find Edges*).

STEP 3

Change the layer blend mode to Color Burn. Now we are getting something that has some interesting texture to it. Duplicate this layer (*Image>Duplicate*) and flatten the image. We will use this image to add some detail to the cliffs later on.

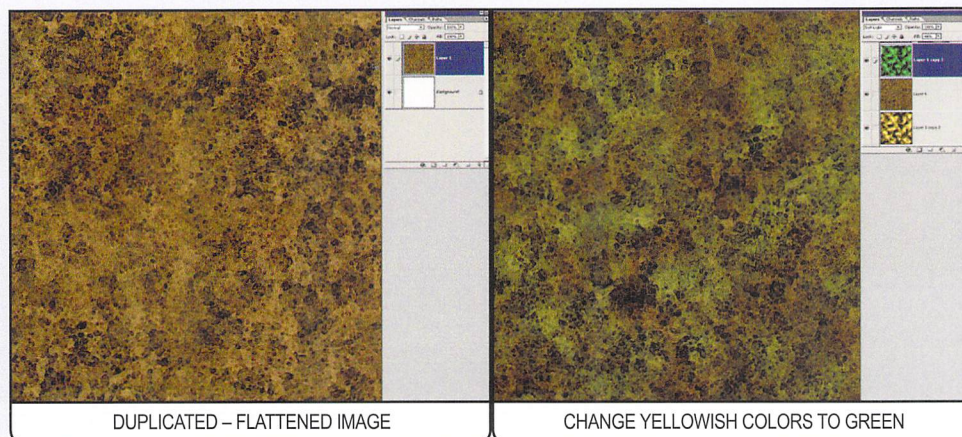


DUPLICATE THE LAYER AND APPLY FIND EDGES FILTER

ORIGINAL LAYERED TEXTURES

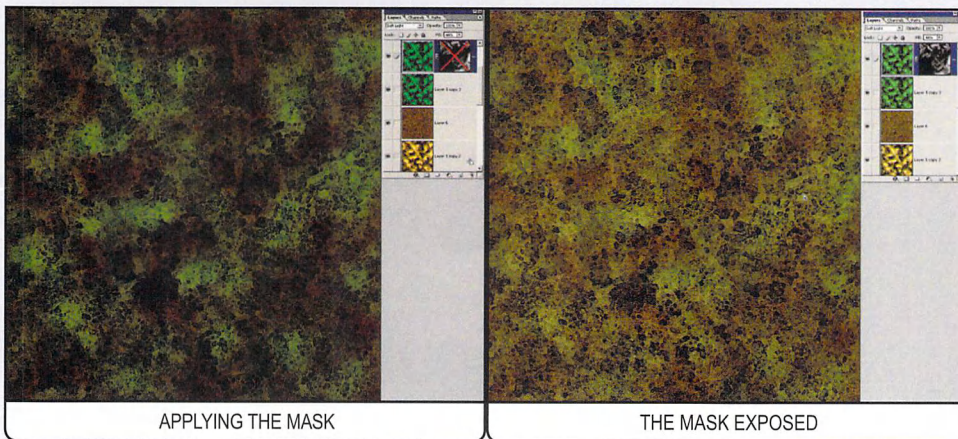
STEP 4

Duplicate your original basic terrain morph layer, which should still be in your layers near the background. Apply the Hue & Saturation and pull the slider until the yellowish colors change to a green hue. Also, reduce the layer's opacity a little to blend it with the image underneath and change the layer blend mode to Soft Light. This will serve as the basic color map for the entire terrain.



DUPLICATED - FLATTENED IMAGE

CHANGE YELLOWISH COLORS TO GREEN



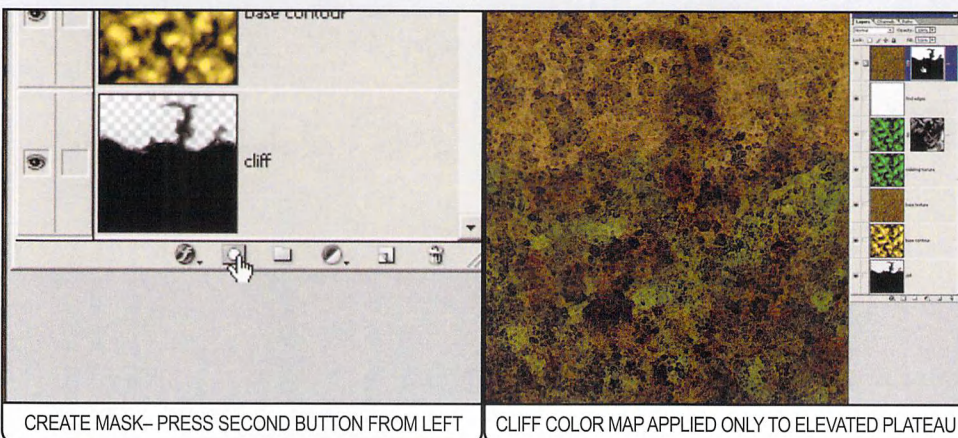
APPLYING THE MASK

THE MASK EXPOSED



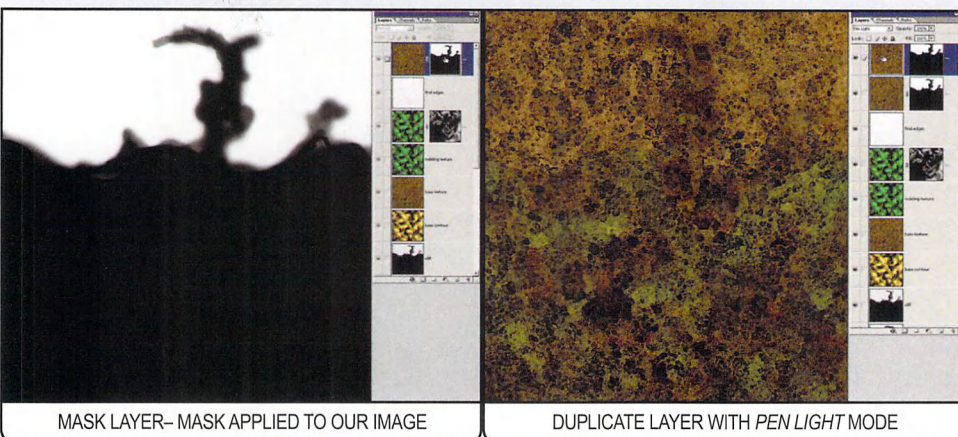
DRAG COLOR MAP INTO WORKING FILE

GO BACK TO LAYER FROM DEFINING THE CLIFF MAP



CREATE MASK- PRESS SECOND BUTTON FROM LEFT

CLIFF COLOR MAP APPLIED ONLY TO ELEVATED PLATEAU



MASK LAYER- MASK APPLIED TO OUR IMAGE

DUPLICATE LAYER WITH PEN LIGHT MODE

STEP 5

Now, duplicate this layer, because we are going to use some of the green hues as greenery for the peaks of our image. So, the next step is to apply a layer mask and fill it with black. This will block out the visual aspects of the layer it is associated with. Make sure that the foreground color is set to white and use the Paintbrush with a low opacity around 30%, and paint the mask to allow the green in the areas that will become the peaks of the model.

STEP 6

Remember our color map that we duplicated in Step 3? Let's go get it and using your Move tool, drag it into your working file.

STEP 7

Go back to the layer that we created our cliff mask from in Step 1 of "Defining the Cliff Map," hold the Ctl key down, and left click on the layer. This will create a selection. From this we will create a mask to define the color information for our cliffs. With your selection on, create a mask by clicking the second button from the left in the layer pallets, as shown in image, at left. [\[Mask\]](#)

As you can see, our cliff color map has been restricted to the section that will only apply to our elevated cliff plateau. Image [\[Mask Layer\]](#) shows the layer mask that has been applied to our image.

STEP 8

Just to add a little more character, I duplicated the layer and gave it a layer blend mode of Pen Light.



STEP 9

After duplicating the layer again, I accessed a filter pack plug-in from NIK Multimedia called Color Efex Pro 2.0. This is an excellent set of filters that was traditionally created for photographers; however, I have found some untraditional uses for them in accenting my textures. You can find out more about *Color Efex Pro 2.0* at www.nikmultimedia.com (there's a free Demo available). My intention is to give the cliff detail a little more color distinction from the rest of the image, so I chose the Graduated Olive filter and set the sliders as shown.

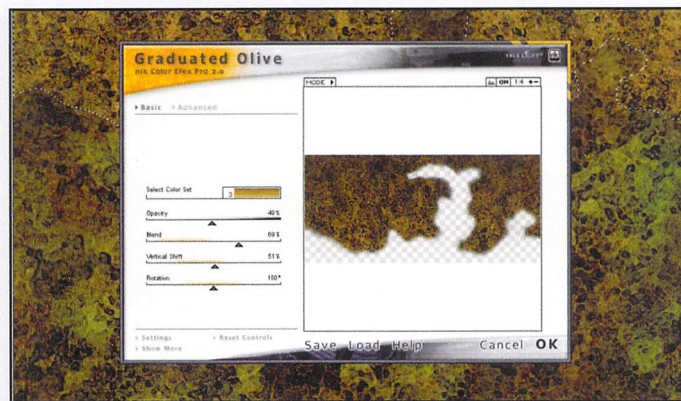
DEFINING THE UPPER CLIFF

I needed a little extra help in defining the higher elevation of my cliff. Since we are working from a topographical perspective, taking a screen shot of the top view will help us define exactly where we want to paint our next texture enhancement.

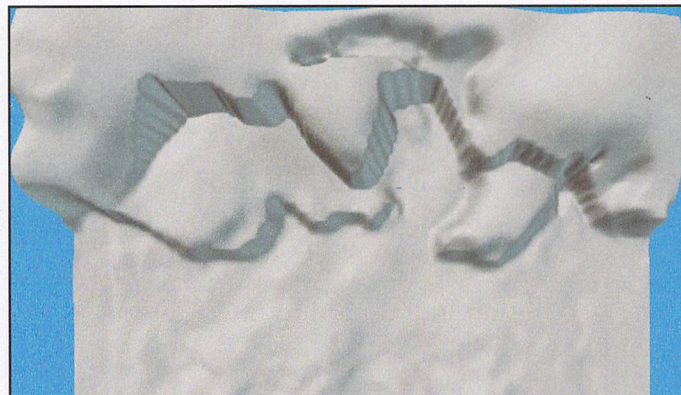
STEP 1

In my top view, I took a screenshot of my landscape.

I placed and positioned it above my working layers. To see through it, there are a couple of blend modes to choose from. One is Screen and the other is Overlay. I used Overlay since the outcome not only defined my contour, but allowed me to see the detail more accurately.



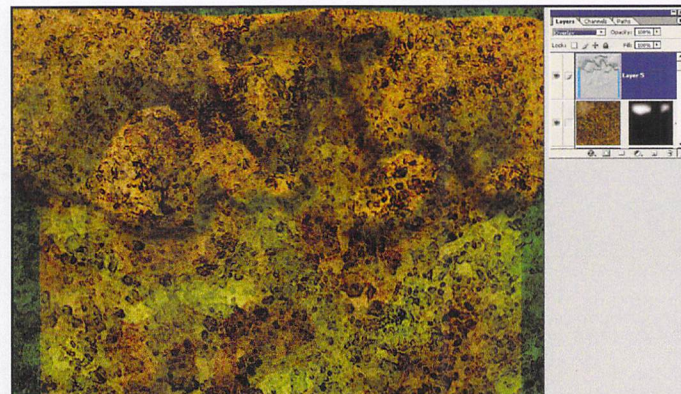
STEP 9- SET THE SLIDERS AS SHOWN ABOVE FOR COLOR EFEX PRO



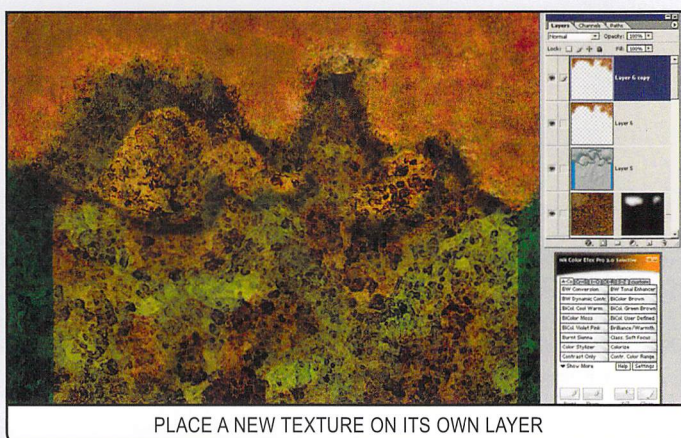
SCREENSHOT OF LANDSCAPES TOP VIEW



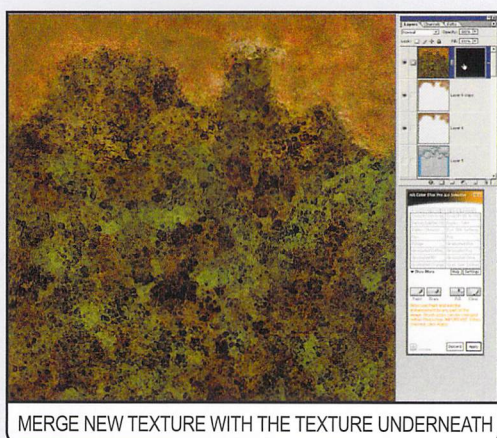
BLEND MODE SET ON SCREEN



BLEND MODE SET ON OVERLAY



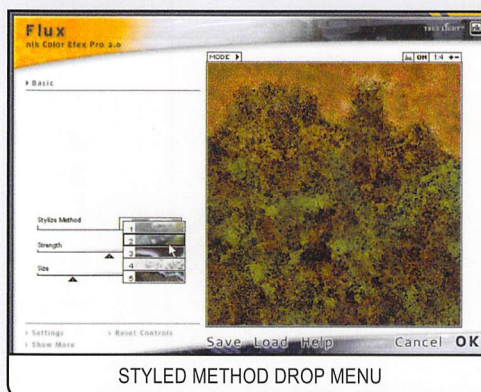
PLACE A NEW TEXTURE ON ITS OWN LAYER



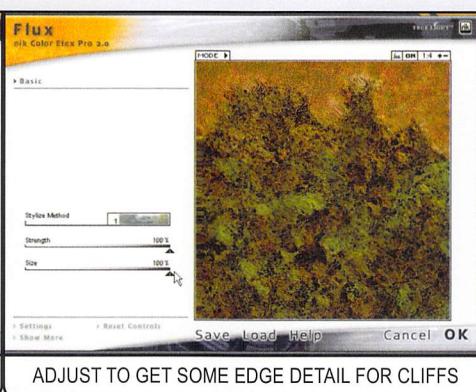
MERGE NEW TEXTURE WITH THE TEXTURE UNDERNEATH



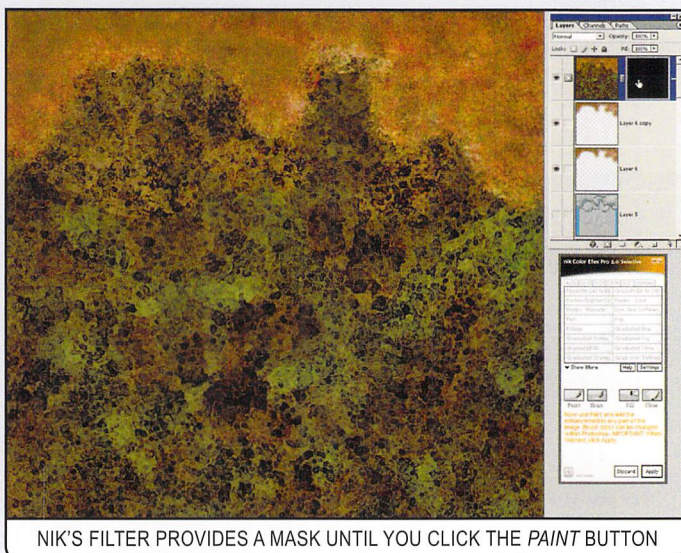
EFEX PRO FLUX



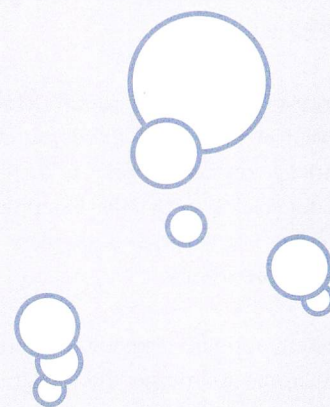
STYLED METHOD DROP MENU



ADJUST TO GET SOME EDGE DETAIL FOR CLIFFS



NIK'S FILTER PROVIDES A MASK UNTIL YOU CLICK THE PAINT BUTTON



STEP 2

It is always a good idea to place a new texture on its own layer when we create it, so let's create a new layer. Also, create a new combination of animated brushes. With this brush, you can start painting in the areas that will isolate the higher elevated information as shown at Left.

STEP 3

When you're done, turn off the visual aspects of the screen captured landscape layer by clicking the eye on the left side of that layer. Merge this new texture with the texture underneath.

STEP 4

Experimenting further with Nik Color Efex Pro 2.0, I went to its floating panel in Photoshop and chose Flux.

Under the Styled Method drop menu, I was presented with several type of effects.

I chose method 1 and increased its strength and size to get some edge detail for my cliffs.

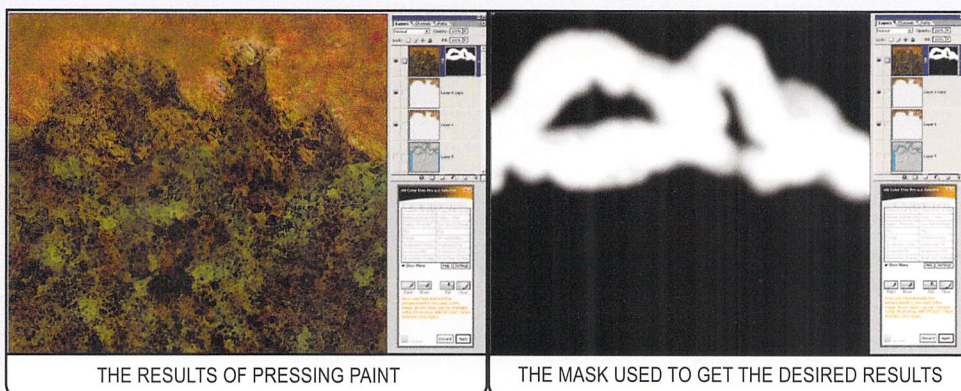
STEP 5

When you're done, click OK. Notice that there seems to be no effect until you look at your layers. Nik's filter has provided a mask blocking out the effect until you click the Paint button.

STEP 6

Pressing the paint button allows you to paint in the effect where you choose. I wanted to restrict it mostly to the edges of my upper cliff levels. The examples show the effect I achieved and the mask used to obtain those results.

When you are finished painting, then click Apply to merge the image and its mask into a single layer.



THE RESULTS OF PRESSING PAINT

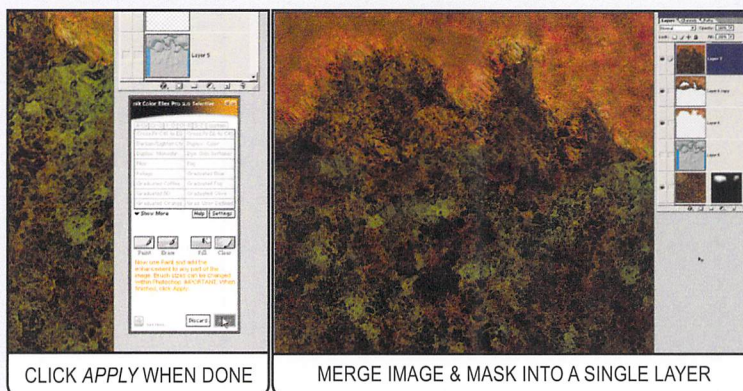
THE MASK USED TO GET THE DESIRED RESULTS

STEP 7

I am going to add some last finishing touches to my terrain. I accessed my *Filter>Texture>Craquelure*.

STEP 8

By adding a mask and painting in the textures only on the portions of the image that represent the peaks, I gave it a lot more of a mountainous feel.

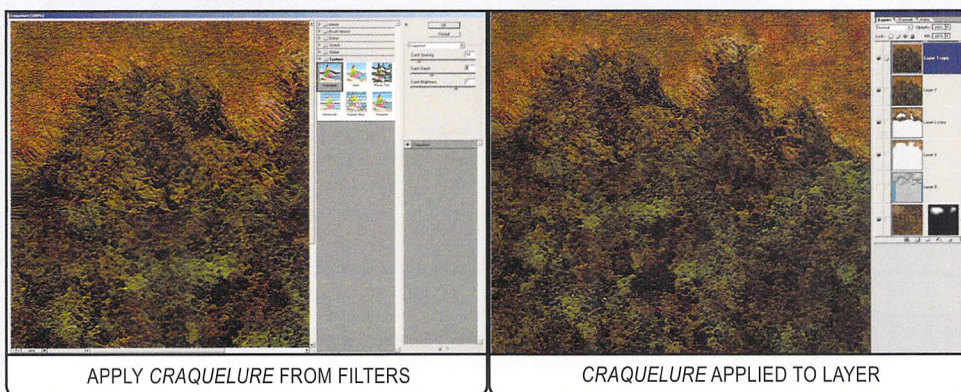


CLICK APPLY WHEN DONE

MERGE IMAGE & MASK INTO A SINGLE LAYER

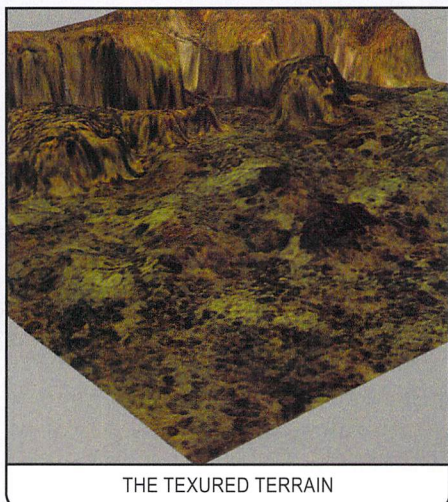
LIGHTWAVE SETTINGS FOR THE TERRAIN

Well, that's all there is to it. The texture was applied as an image map on the Y-axis. Below is what the textured terrain looked like, and on the next page are some of my settings in LightWave before the sub and undersea atmosphere was applied. ■

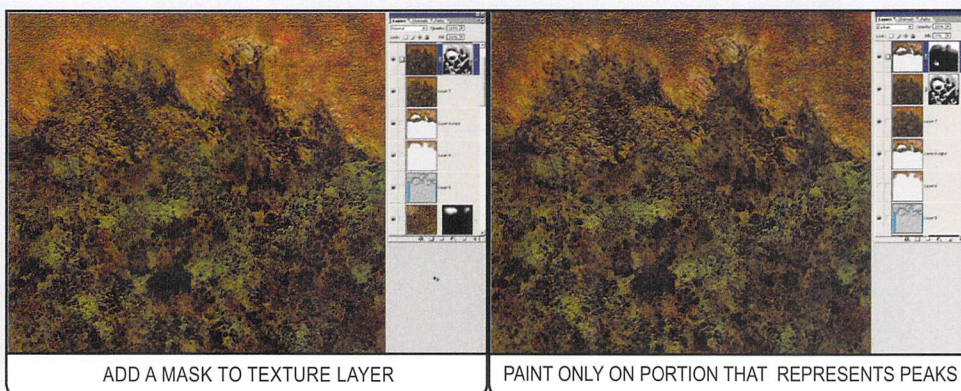


APPLY CRAQUELURE FROM FILTERS

CRAQUELURE APPLIED TO LAYER

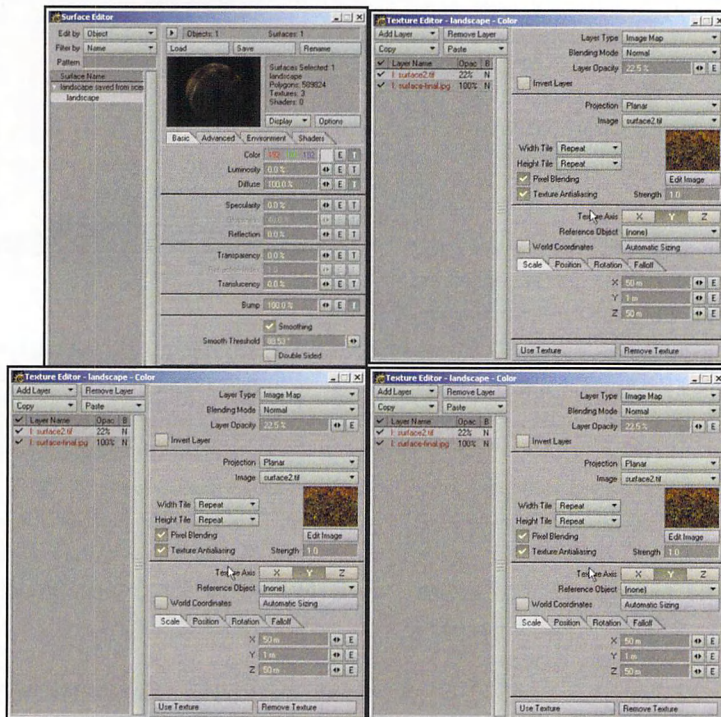


THE TEXTURED TERRAIN

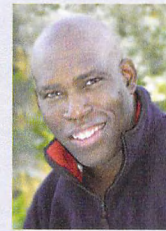


ADD A MASK TO TEXTURE LAYER

PAINT ONLY ON PORTION THAT REPRESENTS PEAKS



LIGHTWAVE SETTINGS PRIOR TO ADDITION OF SUB AND ATMOSPHERE



STEPHEN BURNS HAS DISCOVERED THE SAME PASSION FOR THE DIGITAL MEDIUM AS HE HAS FOR PHOTOGRAPHY AS AN ART FORM. HIS BACKGROUND BEGAN AS A PHOTOGRAPHER 22 YEARS AGO AND IN TIME, PROGRESSED TOWARD THE

DIGITAL MEDIUM. STEPHEN HAS BEEN A CORPORATE INSTRUCTOR AND LECTURER IN THE APPLICATION OF DIGITAL ART AND DESIGN FOR THE PAST 8 1/2 YEARS. HE HAS BEEN EXHIBITING DIGITAL FINE ART INTERNATIONALLY AT GALLERIES SUCH AS DURBAN ART MUSEUM IN SOUTH AFRICA, CITIZENS GALLERY IN YOKAHAMA, JAPAN, AND CECUT MUSEUM OF MEXICO TO NAME A FEW. PART OF HIS EXHIBITING WON HIM 1ST PLACE IN THE PRESTIGIOUS SEYBOLD INTERNATIONAL DIGITAL ARTS CONTEST. OWNER OF BURNS DESIGN, HE TEACHES DIGITAL MANIPULATION WORKSHOPS IN THE SAN DIEGO AREA AND NATIONWIDE. HIS TEACHING STYLE COMES FROM HIS ABILITY TO SHARE AN UNDERSTANDING OF PHOTOSHOP SO THAT THE STUDENT HAS THE ABILITY TO INTUITIVELY APPLY IT TO HIS/HERS CREATIONS.



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we fear change

BY BRAD CARVEY

When my brother, Dana, started in comedy, one of his first characters was "Brad." Brad was based on his eccentric brother – me. While Dana was at *Saturday Night Live*, the Brad character morphed into "Garth," who became well known through the *Wayne's World* movies. During the first *Wayne's World*, Garth was working on some gadgetry project, wearing an outlandish helmet while whacking a moving robotic hand with a hammer. Rob Lowe's character comes up to him and tells Garth that the "Wayne's World" show needs a few changes. Upon hearing this, Garth nervously replies, "We fear change."

It is normal to fear change. It is the fear of the unknown. Even when we know that things need improvement, people tend to want to keep things the same, because at least we know what we're dealing with. Sometimes, it is hard to know when things need changing, but many times if change is not embraced, extinction is the result. This has occurred many times with technological magazines, due to the fact that technology itself changes so rapidly.

During the late 1970s, I started building my first computer. I had to design, build, and test the hardware. I also wrote the operating system and any applications or games that I wanted. At that time, *Popular Electronics* was the magazine that I read for computer news.

There have been many computer magazines that have come and gone in the last thirty years or so. The first computer magazine I can remember reading was *Byte*. *Byte* was a general computing magazine that targeted professional and consumer users. It was a great magazine.

The first computer I bought was a Sinclair ZX80. I built an expansion chassis with expanded memory, 8-channel stereo audio,

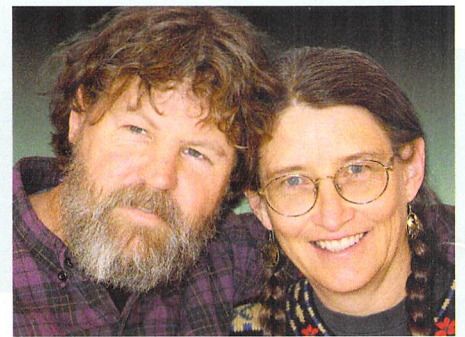
and joystick ports. At the time, it was selling more units than any other computer. Soon, a magazine was published for Sinclair computer users. I think it was called *Spectrum*. Eventually, many magazines and books were published about the Sinclair.

The next computer I used was the Commodore 64. I had a portable unit, called the SX-64. I added an internal speech chip, which allowed it to talk, and modified it so I could watch TV on its monitor. Again, there were lots of magazines and books available.

About twenty years ago, while reading *Byte* magazine, I saw the Amiga computer for the first time. Like many others, I was very excited about the new computer and could not wait to buy one. I was in the process of moving from Los Gatos, California to Albuquerque, New Mexico, and ordered one in both places. I waited frantically for the first Amiga World Magazine to hit the newsstands. During its heyday, many Amiga magazines and books were published.

About fifteen years ago, Lee Stranahan started the first Video Toaster magazine, called *Bread Box*. That later was changed to *Video Toaster User* and lasted a few years. In addition, LightWave has also had dedicated magazines at one time or another. The last magazine specifically dedicated to LightWave and the Video Toaster was *Newtek Pro*, which recently faded away. The Video Toaster is still around and is a very good product, but it's been a while since there was a Video Toaster-specific magazine.

Keyframe was the last magazine that was primarily, but not exclusively, dedicated to LightWave and the Video Toaster, and *Keyframe* is in the process of being combined with *Highend*. When I first heard about the proposed changes at *Keyframe*, I was not sure if I would continue working with the new magazine, because, like



Garth, I fear change. However, I was told that the new magazine will have the same LightWave and Video Toaster coverage as the old *Keyframe* magazine, but will contain expanded coverage for additional software. This seems reasonable to me, and certainly with Dan Alban and myself working on the magazine, LightWave will definitely be covered.

All the other magazines are gone and mostly forgotten. Technology has changed, readers have changed. Even as *Keyframe* changes into a new magazine, it appears that it will have more LightWave and Video Toaster articles than any other magazine currently available. If you are concerned about keeping the level of LightWave and Video Toaster content in the new magazine high, then I suggest you submit articles for publication. You do not have to be an expert to write articles that will inform others. E-mail me with your experience level and interests and I would be happy to suggest some topics that might be worth writing about. ■

BRAD AND ANDREA CARVEY HAVE BEEN DOING COMPUTER ANIMATIONS FOR A LONG TIME. IN 1969 BRAD USED AN ANALOG COMPUTER, WHICH WAS THE SIZE OF A CAR, TO PRODUCE HIS FIRST COMPUTER ANIMATION. ANDREA, AN ARCHEOLOGIST, PREFERS TO DO SCIENTIFIC ANIMATIONS; HER CREDITS INCLUDE PROGRAMS LIKE DISCOVERY CHANNEL'S *UNDERSTANDING CARS*. BRAD IS AN ELECTRICAL ENGINEER AND AN EMMY AWARD-WINNING MEMBER OF THE VIDEO TOASTER DEVELOPMENT TEAM. HE PREFERS TO DO FEATURE FILM WORK. HIS CREDITS INCLUDE FILMS LIKE *MEN IN BLACK*, *STUART LITTLE*, *BLACK HAWK DOWN*, *KATE & LEOPOLD* AND *MASTER OF DISGUISE*.

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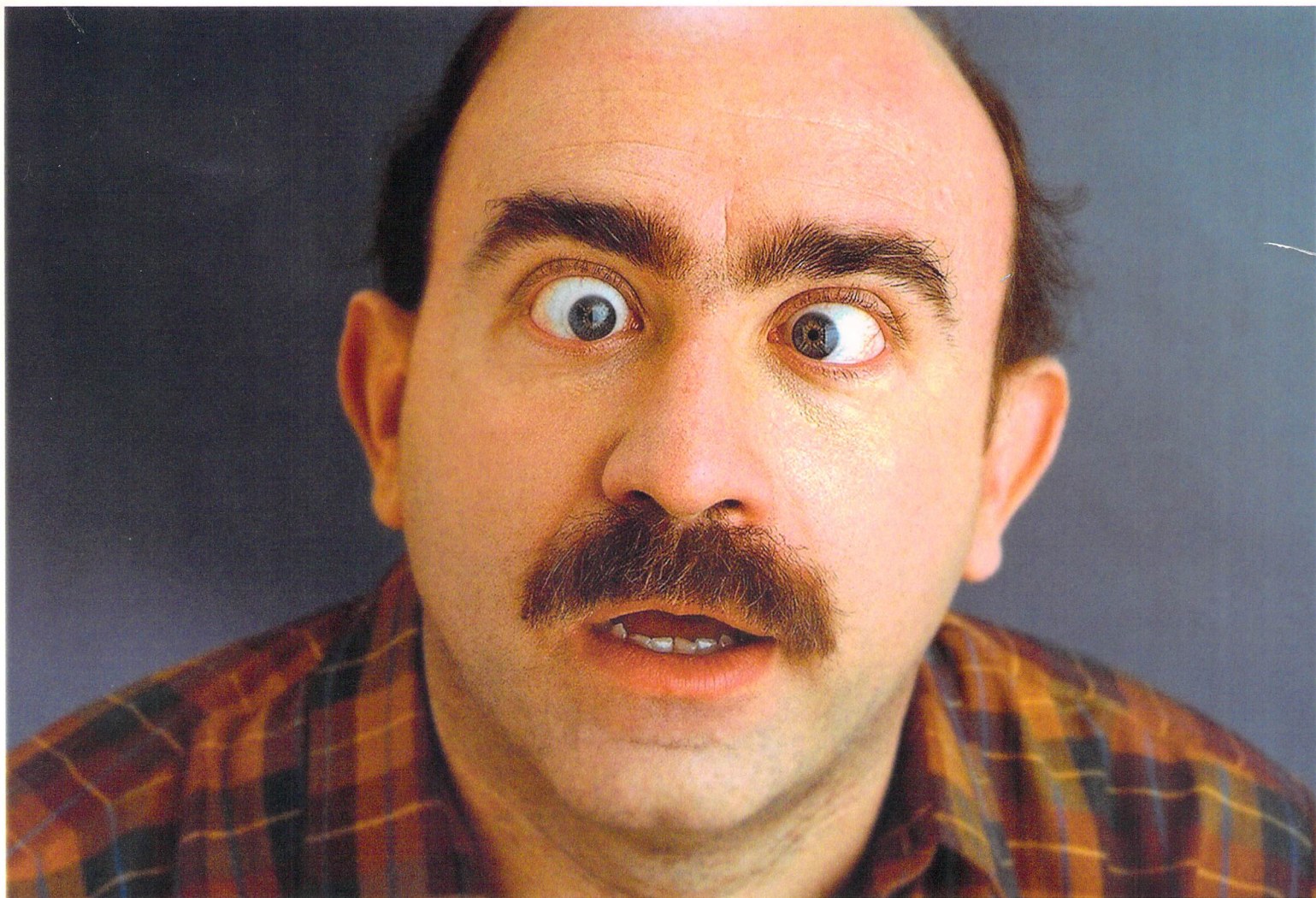
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